WHOI-73-51

# CRUISE REPORT

## CHAIN 112, LEGS I and II
## 6 March - 5 April, 1973

By

R. Heinmiller, Chief Scientist

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Woods Hole, Massachusetts 02543

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TECHNICAL REPORT

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Approved for Distribution Ferris Webster

Ferris Webster, Acting Chairman
Department of Physical Oceanography

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The W.H.O.I. portion of the MODE I array was to be installed on the first two legs of CHAIN 112, along with other work to be done at Site D. The original schedule called for the ship to leave Woods Hole on the 6th of March and return on the 20th. After a two-day layover in Woods Hole, Leg II was scheduled for 22 March through 2 April, terminating in Bermuda.

Objectives of the cruises were:

- Setting of sixteen intermediate moorings and one surface mooring at the MODE Site (centered at 28° N., 69° 40'W.). See Figure 4.
- Recovery of two MODE-Site maintenance moorings
- Recovery of three intermediate moorings in the vicinity of Site D (39° 10'N., 70° 00'W.).
- Setting of three new intermediate moorings at Site D. These were to be set by a faking-box technique, rather than the conventional method
- CTDs at each new mooring
- Bathymetry and meteorological observations
- Gravity section, Woods Hole to MODE area and return

Leg I

R/V CHAIN left Woods Hole at 1840R on the 6th of March, 1973. We spent several hours in Vineyard Sound calibrating the radio direction finder, using a transmitter on the W.H.O.I. dock. After a CTD on the Continental Shelf, the ship proceeded south, following the 70th meridian to facilitate a gravity section. On the morning of 9 March, just inside the northern edge of the MODE area, we stopped for a series of

acoustic anchor release test lowerings which lasted seven hours. All releases checked out without problems.

Early on the morning of the 10th we arrived at the site of Station 474, which had been set in December, 1972 as a long-term site-maintenance mooring, and which was close to the proposed site of MODE moorings #1 and #25. After a check of the release on 474 we proceeded to set the surface mooring (#25) about three miles north, designated Station 480. This mooring used an experimental float and wire terminations but had no release or backup recovery glass ball section. It was intended primarily as a navigation marker. Station 474 was then recovered before launching MODE mooring #1, Station 481. Normal launch procedure for both surface and subsurface moorings is to drop the flotation and pay out the mooring line and instruments while the ship steams at about two knots. The anchor is attached and dropped and allowed to freefall to the bottom. The transponder in the anchor release is tracked until the anchor bottoms. All moorings are shown as set in the figures. Release checks were completed and the ship underway by 2300R on the 10th. The ship moved to a site three miles north of 481 for a CTD.

Early on the morning of the 11th we recovered Station 473, the other site-maintenance mooring set in December. After a bathymetric survey we set Station 482, MODE #8. This mooring had to be towed about two miles at the end of the launch to get the proper depth due to set from a surface current estimated at one and one-half knots. A CTD was taken three miles away.

The CHAIN then proceeded to the site of MODE #15, the first of the moorings in the outer ring of six. This mooring was set as

Station 483 on the morning of the 12th. Moorings #16 (Station 484), #11 (Station 485), and #12 (Station 486) in quick succession. In each case a bathymetric survey was done before setting and a CTD was done after launch about three miles away. During the setting of Station 486 a large tanker passed astern, between the second and third clusters of glass balls. However, the vessel apparently did not come in contact with the mooring line.

We arrived at the site of MODE mooring #13 at 2230R on 14 March. Since the bottom was flat no survey was done. The mooring was launched without difficulty and the anchor dropped. However, after descending to a depth of about 3,000 meters the acoustic transponder began coming back up. The radio was still on the surface. The mooring string was recovered and it was found that the twenty-meter nylon tag-line had parted at the splice just below the release. This aborted mooring was designated Station 487. After a CTD the mooring was reset as Station 488 on the morning of the 15th.

Station 489 (MODE #14) was set without difficulty early on the 16th and after a CTD the ship proceeded north towards Site D. CHAIN arrived at Site D on the morning of the 18th in steadily worsening weather. It was decided to leave all the Site-D moorings until Leg II. The ship docked in Woods Hole at 1100R on 19 March. The ship's track in the MODE array on Leg I is shown in Figure 1.

## Leg II

Work scheduled for Leg II now included, besides the originally planned eight moorings, all three of the Site-D moorings. CTDs, bathymetry, and meteorological observations were to be continued.

The scheduled sailing date of 22 March was first postponed one day due to bad weather. On the morning of the 23rd an auxiliary generator breakdown forced an additional delay. CHAIN eventually left Woods Hole at 1540R on 25 March. Discussions were held with the MODE Ship Committee and an extension until 4 April was tentatively granted.

Upon arrival at the location of Station 479 early on the 26th two releases were tested. Shortly after, Station 479 was released and recovered.

Station 490, the replacement mooring, was set from the faking box in steadily deteriorating weather. In this launch technique the entire mooring is assembled and laid out in an especially-designed box on the fantail. The anchor is dropped and the mooring allowed to run out freely with the ship steaming slowly. Launch took ten minutes and anchor bottoming another twenty. There appeared to be fouling in the middle glass-ball section.

By the time the ship had arrived at Station 477 and we had released the mooring the weather had worsened. Recovery of the mooring was difficult and several glass balls were broken during the operation. Station 491, the replacement mooring, was set in the afternoon. Due to heavy seas the mooring did not pay out of the faking box smoothly and some minor fouling was observed.

By the time we reached Station 478, the last of the Site-D moorings to be replaced, the weather was too rough to allow any work. The ship jogged into the wind all night of the 26th and all day the 27th. The faking box suffered some damage on the fantail.

By the time the weather had moderated on the afternoon of the 28th it had been decided, in view of the condition of the faking box and the fouling problems on earlier launchs, to launch the final Site-D mooring by the conventional method.

At 1830R on the 28th Station 478 was released and hauled without difficulty. A release test was done late in the evening and Station 492 was launched in the early hours of March 29. Moorings in the Site-D area are shown in Figure 2. The ship proceeded south towards the MODE area.

Shortly after entering the MODE area on the 30th we did a series of release lowerings and a test CTD, and continued south. After checking Station 489 (MODE #14) we arrived at the proposed site of mooring #6 at noon on March 31. After a brief bottom survey the mooring was launched as Station 493, followed by a CTD which revealed several problems with the CTD winch. The wire and winch were to give continual trouble for the rest of Leg II.

Station 494 (MODE #5) was set early on the 1st of April, followed by a CTD. While steaming towards the site of MODE #10 the CTD wire was streamed over the side and rewound in an effort to improve the lay on the drum and the level winding. While the wire was streamed, the ship passed close by a buoy which was later identified as a drift buoy belonging to the Atlantic Oceanographic and Meteorological Laboratory.

The launch of Station 495 (MODE #10) went smoothly but the setting of MODE #9 was delayed several hours into the early hours of April 2, by computer difficulties which prevented final calculation of the shot lengths. Launch was finally begun just before 0500Q and the anchor was dropped at 0624Q. However, about an hour later, at a depth of

approximately 3,000 meters, the transponder began indicating decreasing ranges. The mooring was picked up and it was found that the nylon anchor tag line had been cut about three meters below the release, in a manner very similar to Station 487 on Leg I. The aborted station was 496. The gear was reset successfully as Station 497. The ship moved several miles away for a CTD and a test of an AMF depth telemetering pinger on the CTD wire.

After Station 498 (MODE #4) was set, the release on the central mooring, Station 481, was checked before proceeding to the surface mooring. The 2398 kc radio beacon on the surface float had failed sometime earlier. A party was sent aboard in an attempt to repair it. However, it was found that the well containing the transmitter had leaked and the electronics had been damaged. The transmitter and keyer package was removed from the float.

MODE moorings #3 (Station 499), #2 (Station 500), and #7 (Station 501) were set in quick succession, each followed by a CTD.

The ship left the site of Station 501 at 0930Q on 4 April and arrived in St. Georges, Bermuda at 1035Q on the 5th. Figure 3 shows the ship's track in the MODE array on Leg II.

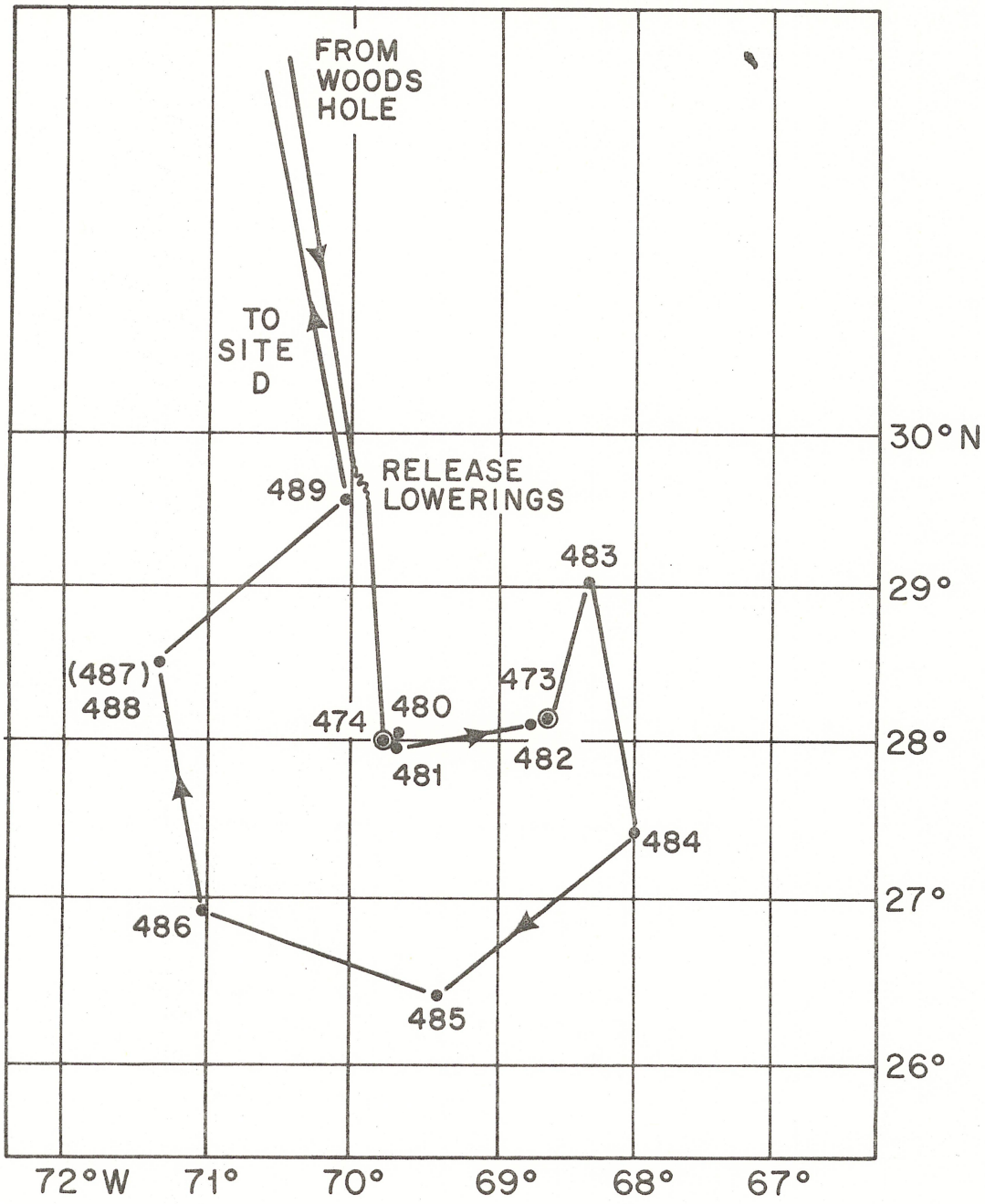
Subsequent inspection of the parted anchor tag lines from Stations 487 and 496 indicated that the probable cause of failure was tangling of the tag line in the acoustic release.

## Experiments Initiated and/or Completed and Date Collected on CHAIN 112, Legs I and II

- Recovery of MODE site maintenance moorings (473 and 474) - Schmitz
- Initiation of MODE I array (480, 481, 482, 483, 484, 485, 486, 488, 489, 493, 495, 496, 497, 498, 499, 500 and 501) - Schmitz, Fofonoff, Webster, Wunsch
- Continuation of long-term mooring array on the Slope near Site D (replaced 477, 478, and 479 with 490, 491 and 492) - R. Thompson
- Test of Alden surface buoy (480) - Walden
- Gravity section - Dean
- Exposure of plastic samples (498) - W. Vachon, Draper Lab.
- Test of AMF depth telemetering pinger - W. Coburn, AMF
- Thirteen CTDs - Volkmann
- Bathymetry - MODE Council
- Meteorological measurements - MODE Council
- Exposure of corrosion samples (recovered on 474 and reset on 482) - Dexter

## Personnel

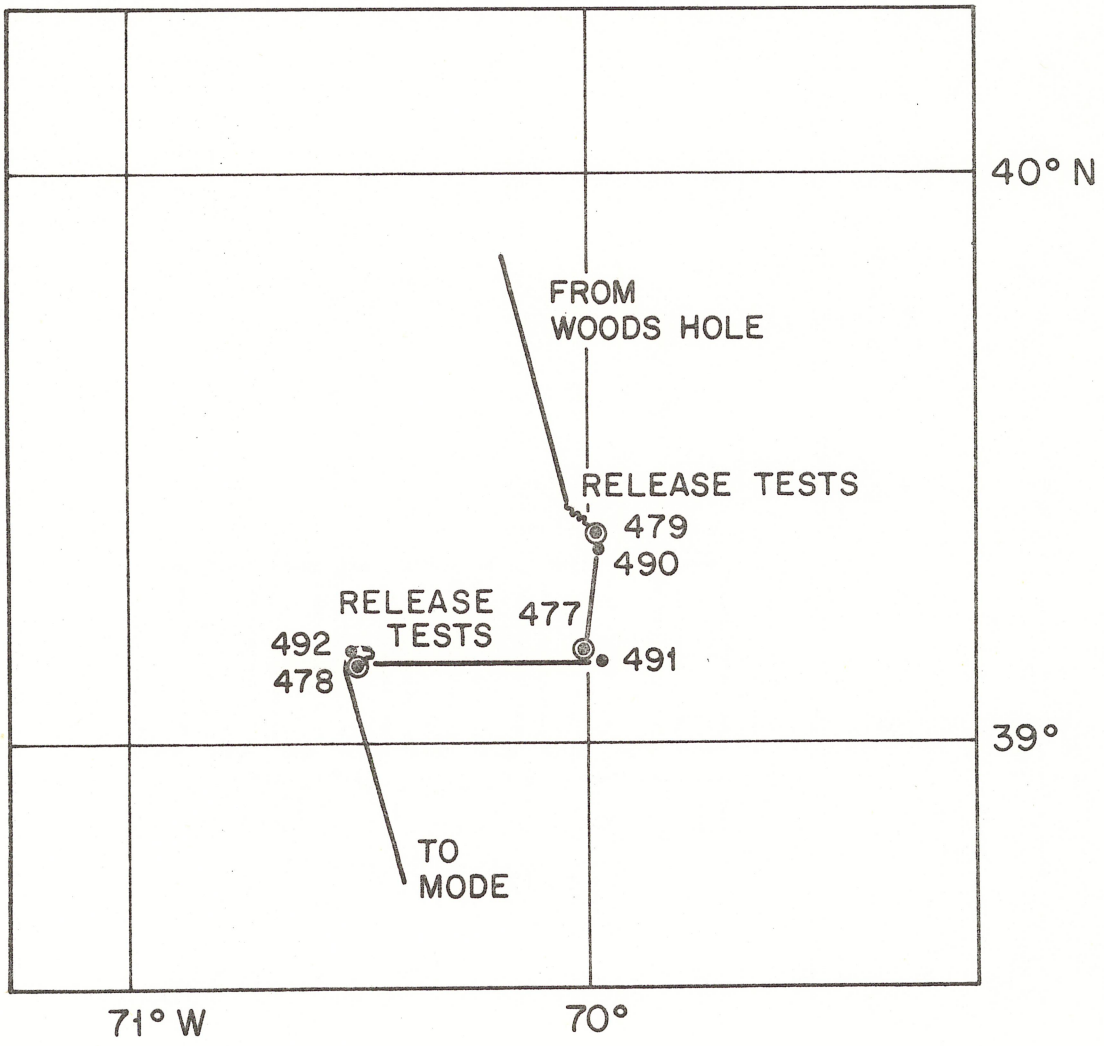
| | Leg I | Leg II |
|---|---|---|
| Robert Heinmiller | X | X |
| James Gifford | X | X |
| George Tupper | X | X |
| David Simoneau | X | X |
| John Scharff | X | X |
| Roderique LaRochelle | X | X |
| Harold Armstrong | X | X |
| Avron Zwilling | | X |
| William Horn | X | X |
| Joseph Poirier | | X |
| Robert Jordan | | X |
| Alan Bruen | X | X |
| Robert Walden | X | |
| Paul Stimson | | X |
| William Schmitz | X | X |
| Robert Millard | X | |
| Gordon Volkmann | | X |
| Douglas Moore | X | |
| Stephen Dexter | X | |
| Stanley Hayes | | X |
| Edward Anderson | | X |
| Michael Parke | X | X |
| Susan Tarbell | X | X |
| Caroline Harlow | X | |
| Jerry Dean | X | |
| Nancy Bauchmann | X | X |
| Frederic Schneider | | X |
| Susan Ashton (M.I.T.) | | X |
| Dallas Abbott (M.I.T.) | | X |
| Richard Shepard (M.I.T./Draper Lab.) | | X |
| Robert Reid (M.I.T./Draper Lab) | X | |
| Glenn Flierl (Harvard) | X | |
| Adam Giffard (Centre Films) | X | |
| James O'Sullivan (Student) | X | |




SHIP'S TRACK ON LEG I

- SETTING
- RECOVERY
- ( ) MOORING ABORTED

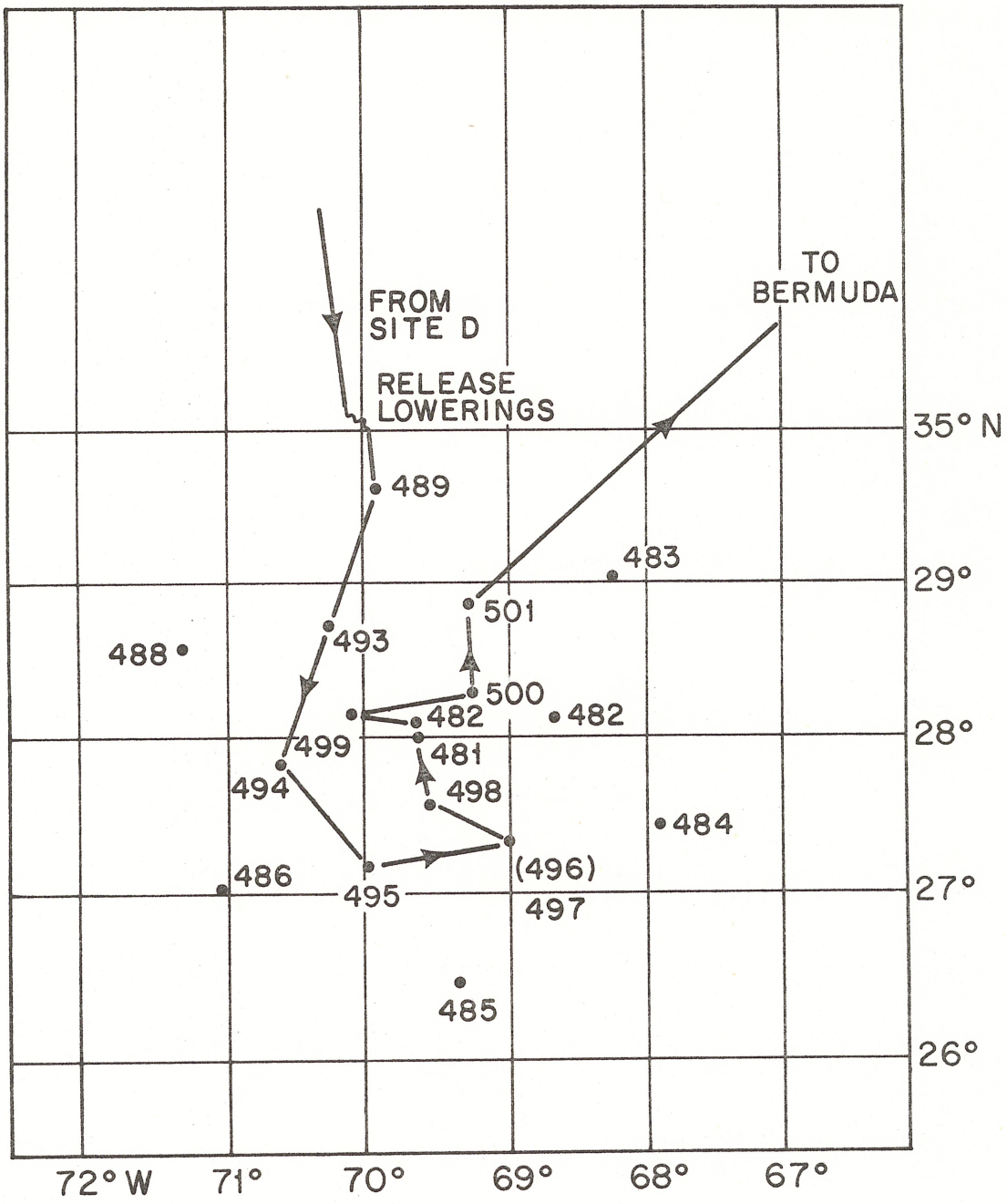
FIG. 1




SHIP'S TRACK IN SITE D AREA ON LEG II

- SETTING
- RECOVERY

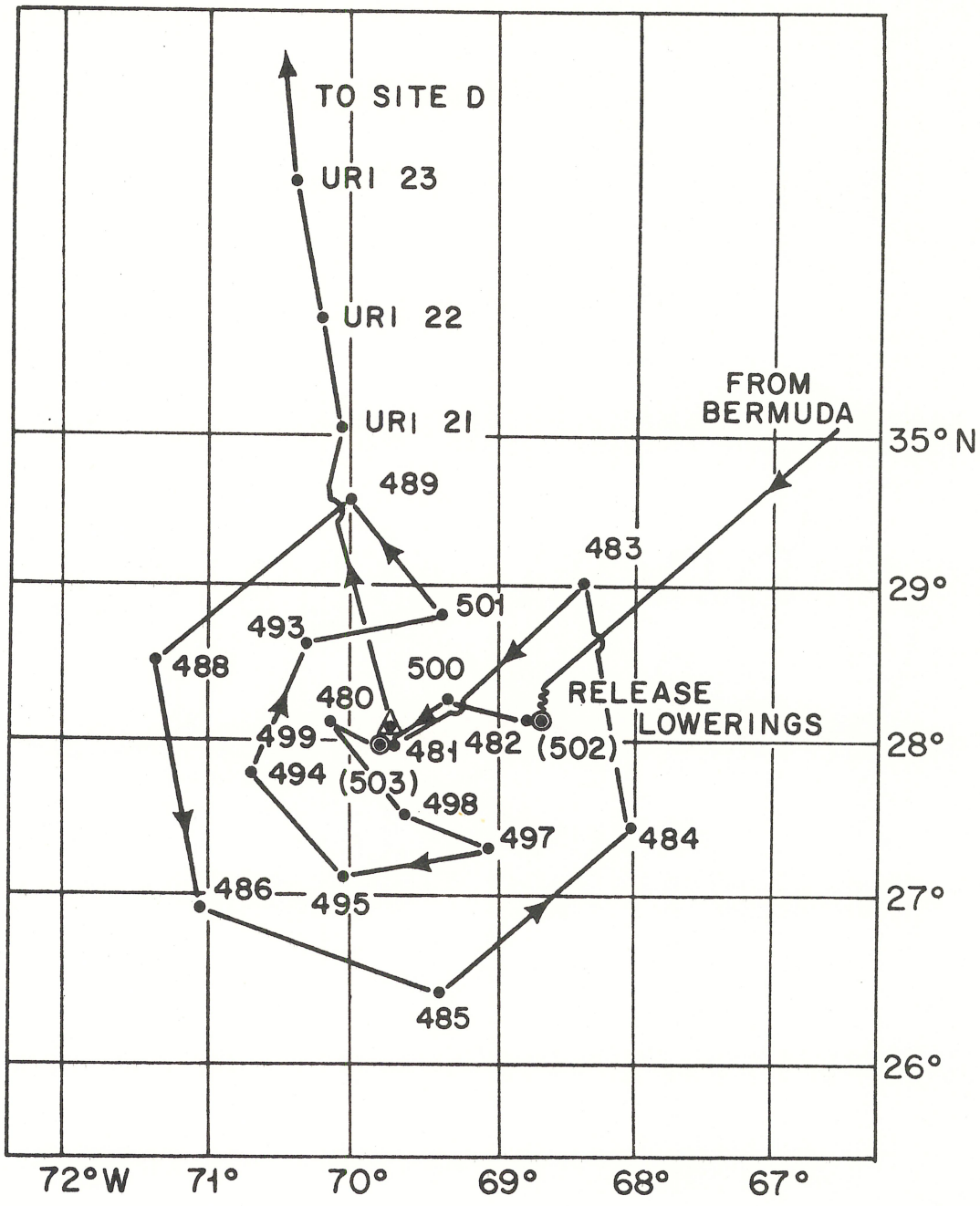
FIG. 2




SHIP'S TRACK ON LEG II

• SETTING
( )MOORING ABORTED

FIG. 3



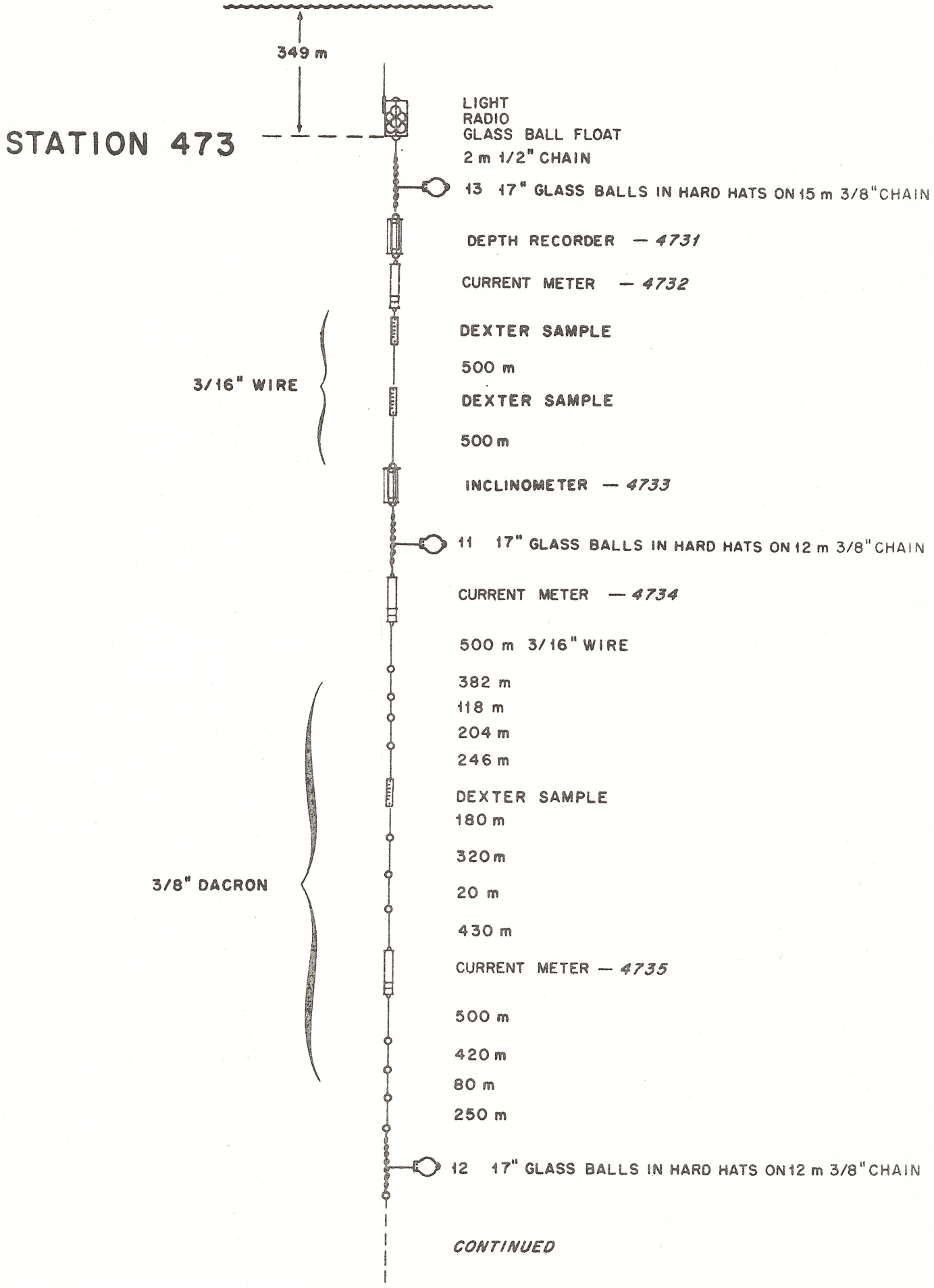

SHIP'S TRACK IN MODE AREA

◉ ( ) MOORINGS SET

• MOORINGS RECOVERED

▲ MOORING LOST

FIG. 4 - LEGS I & II, CHAIN 112


349 m
STATION 473
LIGHT
RADIO
GLASS BALL FLOAT
2 m 1/2" CHAIN
13 17" GLASS BALLS IN HARD HATS ON 15 m 3/8" CHAIN
DEPTH RECORDER — 4731
CURRENT METER — 4732
DEXTER SAMPLE
500 m
3/16" WIRE
DEXTER SAMPLE
500 m
INCLINOMETER — 4733
11 17" GLASS BALLS IN HARD HATS ON 12 m 3/8" CHAIN
CURRENT METER — 4734
500 m 3/16" WIRE
382 m
118 m
204 m
246 m
DEXTER SAMPLE
180 m
320 m
3/8" DACRON
20 m
430 m
CURRENT METER — 4735
500 m
420 m
80 m
250 m
12 17" GLASS BALLS IN HARD HATS ON 12 m 3/8" CHAIN
CONTINUED

*CONTINUED*

# STATION 473

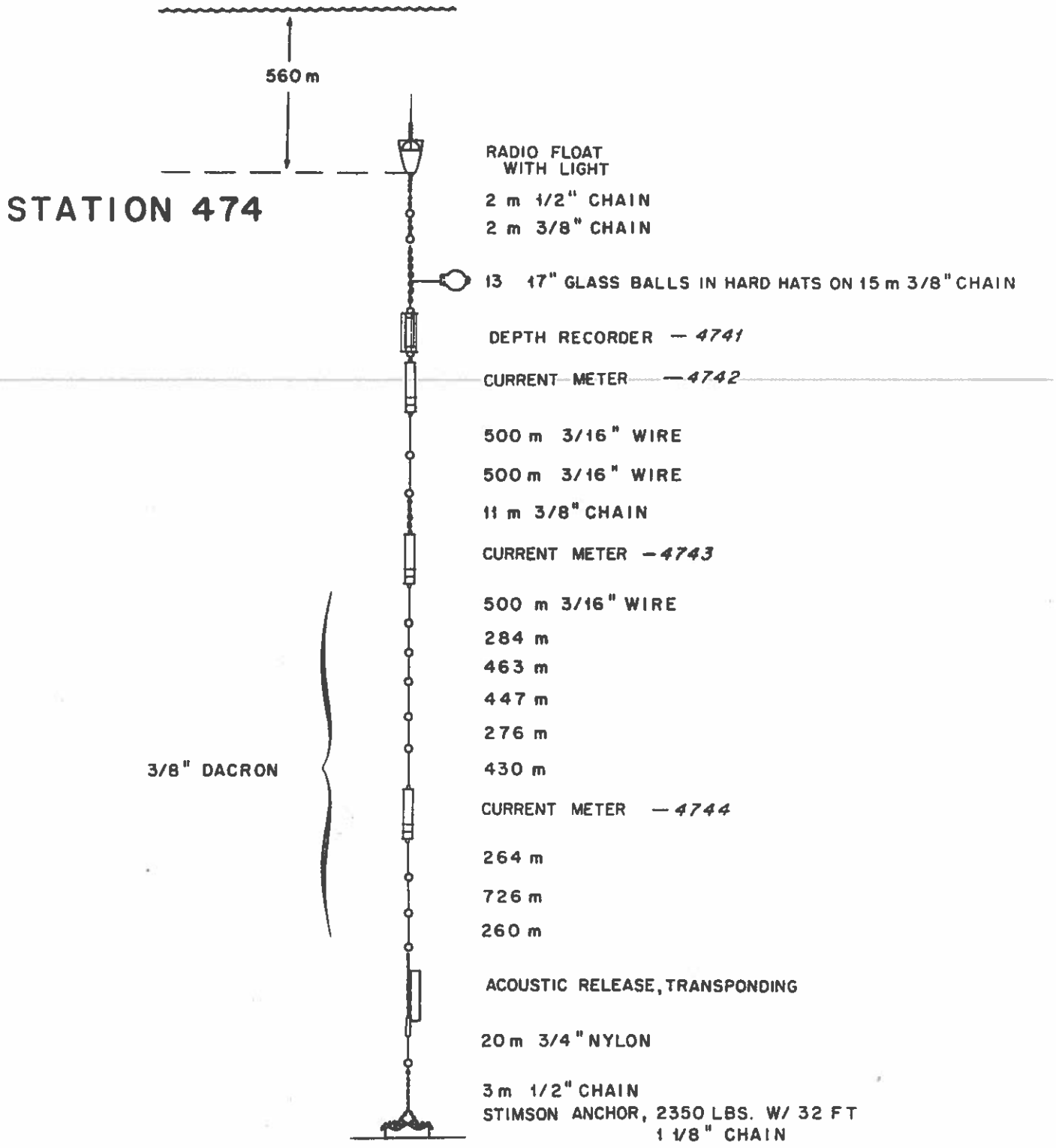
DEXTER SAMPLE

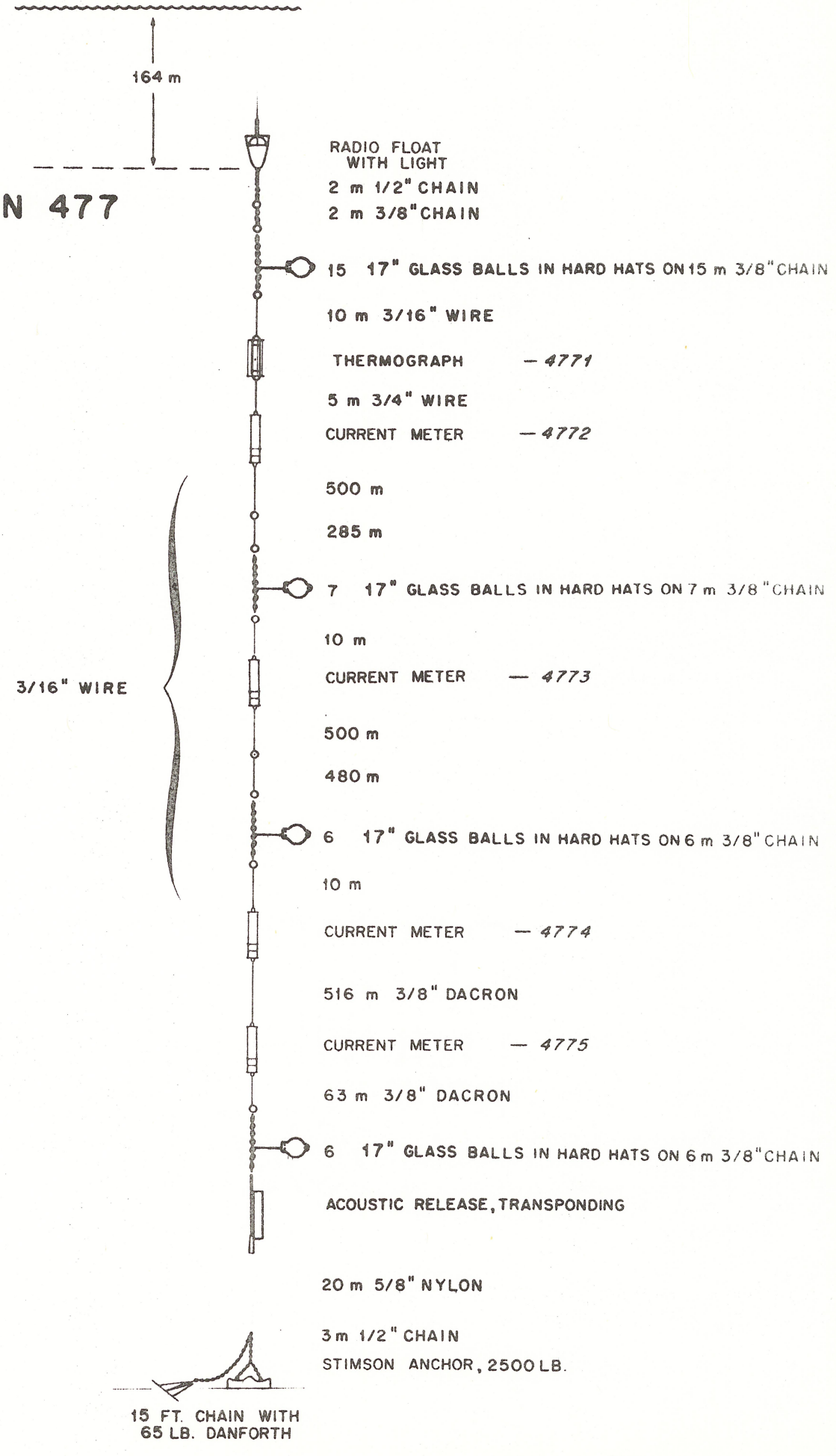
ACOUSTIC RELEASE, TRANSPONDING

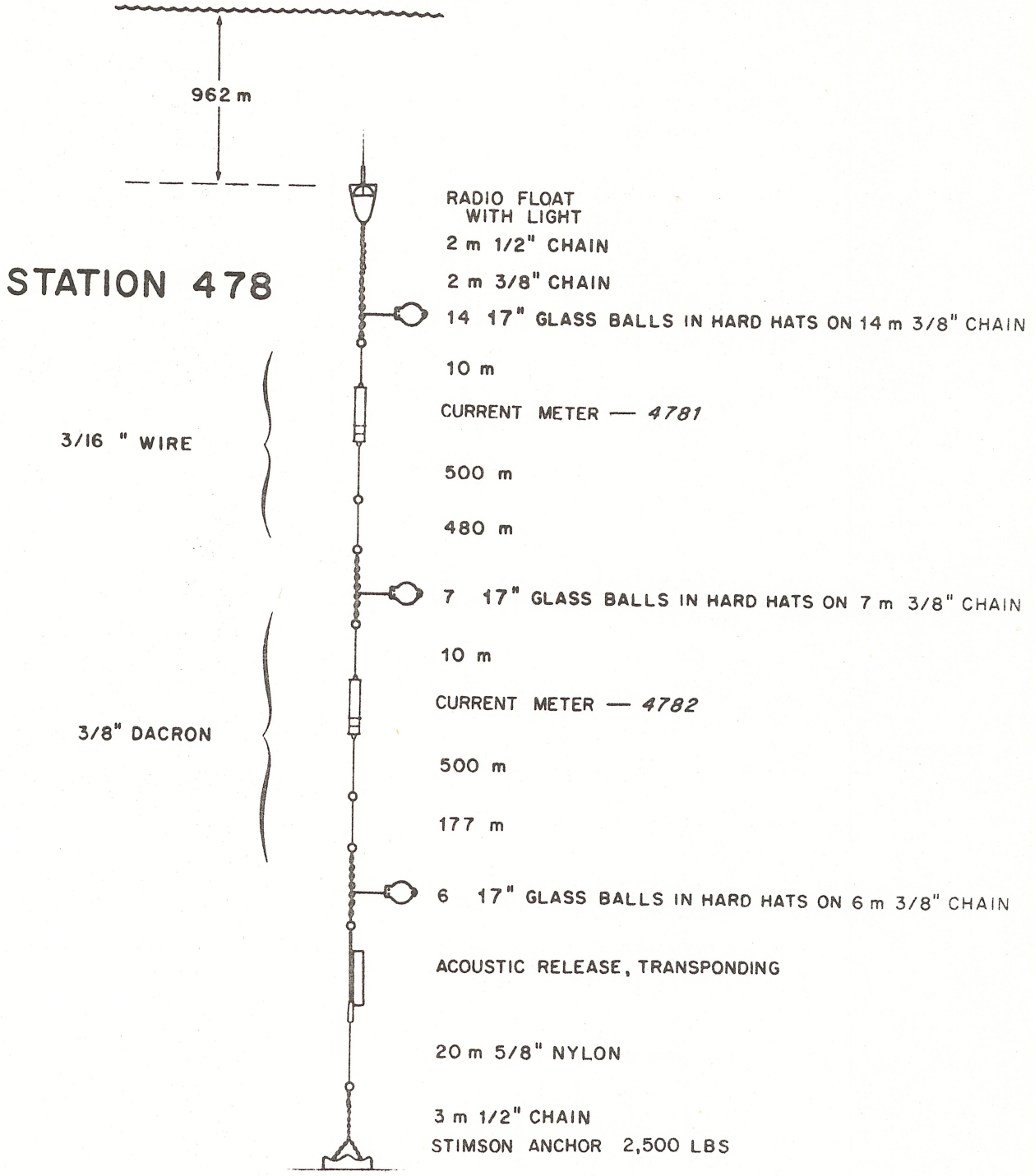
20 m 3/4" NYLON

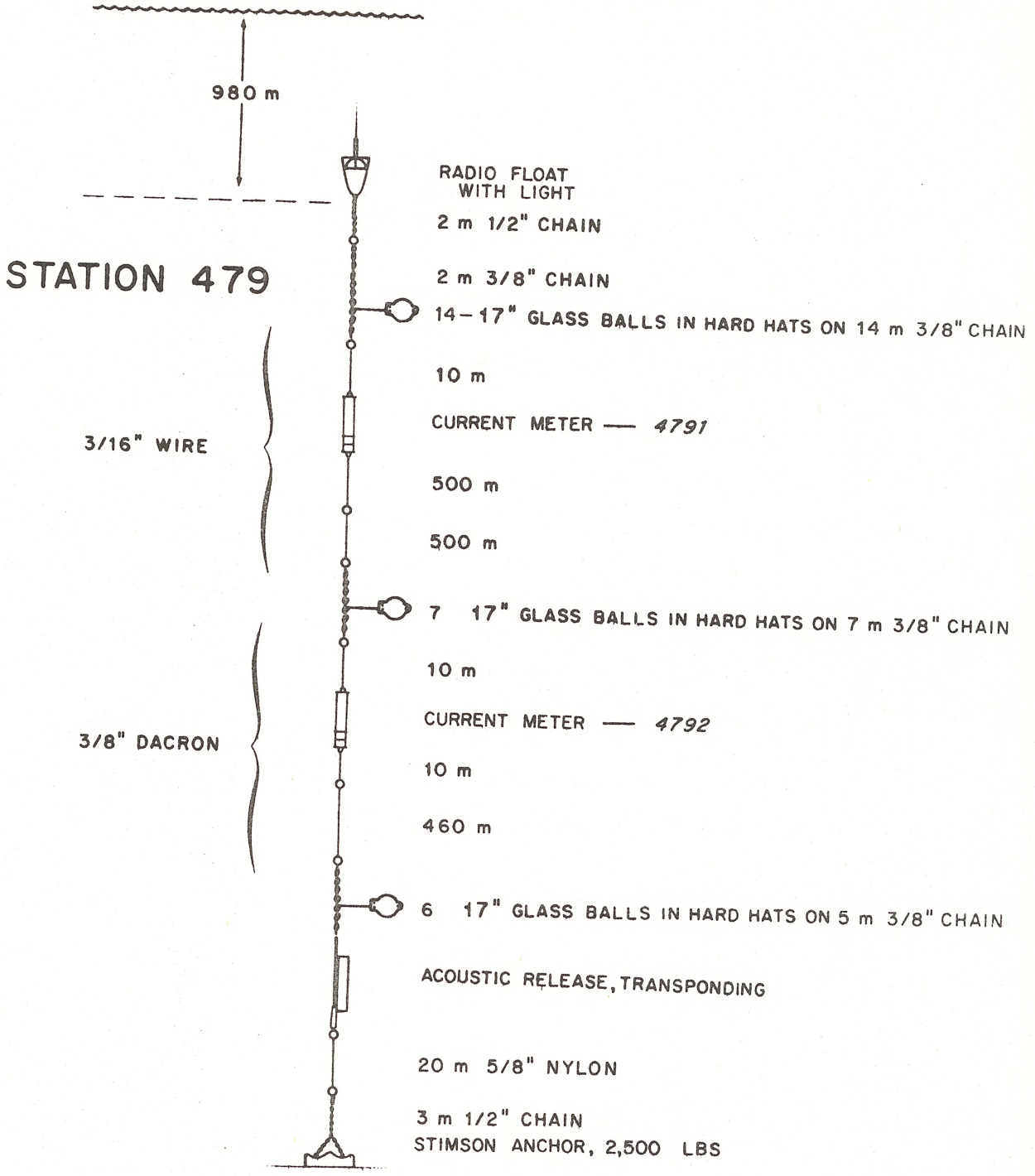
3 m 1/2" CHAIN

STIMSON ANCHOR, 2600 LBS. W/ 32 FT.
1 1/8" CHAIN

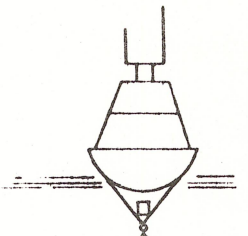

560 m
STATION 474
RADIO FLOAT
WITH LIGHT
2 m 1/2" CHAIN
2 m 3/8" CHAIN
13 17" GLASS BALLS IN HARD HATS ON 15 m 3/8" CHAIN
DEPTH RECORDER — 4741
CURRENT METER — 4742
500 m 3/16" WIRE
500 m 3/16" WIRE
11 m 3/8" CHAIN
CURRENT METER — 4743
500 m 3/16" WIRE
284 m
463 m
447 m
276 m
3/8" DACRON
430 m
CURRENT METER — 4744
264 m
726 m
260 m
ACOUSTIC RELEASE, TRANSPONDING
20 m 3/4" NYLON
3 m 1/2" CHAIN
STIMSON ANCHOR, 2350 LBS. W/ 32 FT
1 1/8" CHAIN


164 m
STATION 477
RADIO FLOAT
WITH LIGHT
2 m 1/2" CHAIN
2 m 3/8" CHAIN
15 17" GLASS BALLS IN HARD HATS ON 15 m 3/8" CHAIN
10 m 3/16" WIRE
THERMOGRAPH — 4771
5 m 3/4" WIRE
CURRENT METER — 4772
500 m
285 m
7 17" GLASS BALLS IN HARD HATS ON 7 m 3/8" CHAIN
10 m
CURRENT METER — 4773
3/16" WIRE
500 m
480 m
6 17" GLASS BALLS IN HARD HATS ON 6 m 3/8" CHAIN
10 m
CURRENT METER — 4774
516 m 3/8" DACRON
CURRENT METER — 4775
63 m 3/8" DACRON
6 17" GLASS BALLS IN HARD HATS ON 6 m 3/8" CHAIN
ACOUSTIC RELEASE, TRANSPONDING
20 m 5/8" NYLON
3 m 1/2" CHAIN
STIMSON ANCHOR, 2500 LB.
15 FT. CHAIN WITH
65 LB. DANFORTH


962 m
STATION 478
RADIO FLOAT
WITH LIGHT
2 m 1/2" CHAIN
2 m 3/8" CHAIN
14 17" GLASS BALLS IN HARD HATS ON 14 m 3/8" CHAIN
10 m
CURRENT METER — 4781
3/16 " WIRE
500 m
480 m
7 17" GLASS BALLS IN HARD HATS ON 7 m 3/8" CHAIN
10 m
CURRENT METER — 4782
3/8" DACRON
500 m
177 m
6 17" GLASS BALLS IN HARD HATS ON 6 m 3/8" CHAIN
ACOUSTIC RELEASE, TRANSPONDING
20 m 5/8" NYLON
3 m 1/2" CHAIN
STIMSON ANCHOR 2,500 LBS


980 m
STATION 479
RADIO FLOAT
WITH LIGHT
2 m 1/2" CHAIN
2 m 3/8" CHAIN
14 – 17" GLASS BALLS IN HARD HATS ON 14 m 3/8" CHAIN
10 m
CURRENT METER — 4791
3/16" WIRE
500 m
500 m
7 17" GLASS BALLS IN HARD HATS ON 7 m 3/8" CHAIN
10 m
CURRENT METER — 4792
3/8" DACRON
10 m
460 m
6 17" GLASS BALLS IN HARD HATS ON 5 m 3/8" CHAIN
ACOUSTIC RELEASE, TRANSPONDING
20 m 5/8" NYLON
3 m 1/2" CHAIN
STIMSON ANCHOR, 2,500 LBS

# STATION 480



LIGHT
CB BEACON
HF BEACON
RADAR TRANSPONDER
NOVA TRANSPONDER
WIND RECORDER — 4801

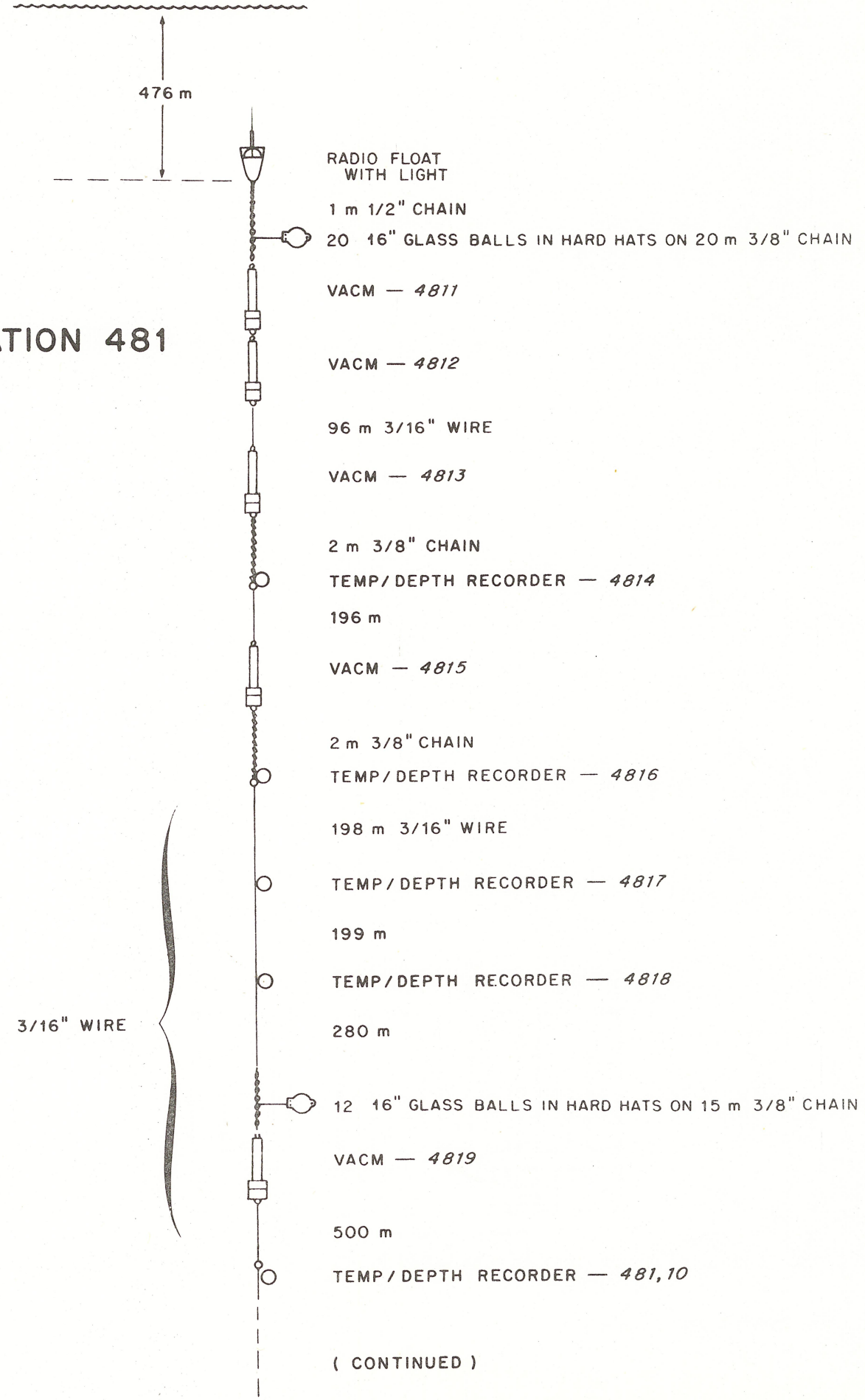
TELEM. TENSION CELL
10 m 1/2" CHAIN
SWIVEL
100 m
100 m
100 m
100 m
500 m
500 m
500 m
22 m
515 m
502 m
529 m
512 m
480 m
589 m
20 m 3/4" NYLON
3 m 1/2" CHAIN
STIMSON ANCHOR, 5850 LBS.

3/8" 3x19 WIRE ROPE

5/16" " " "

5/8" NYLON

# STATION 481

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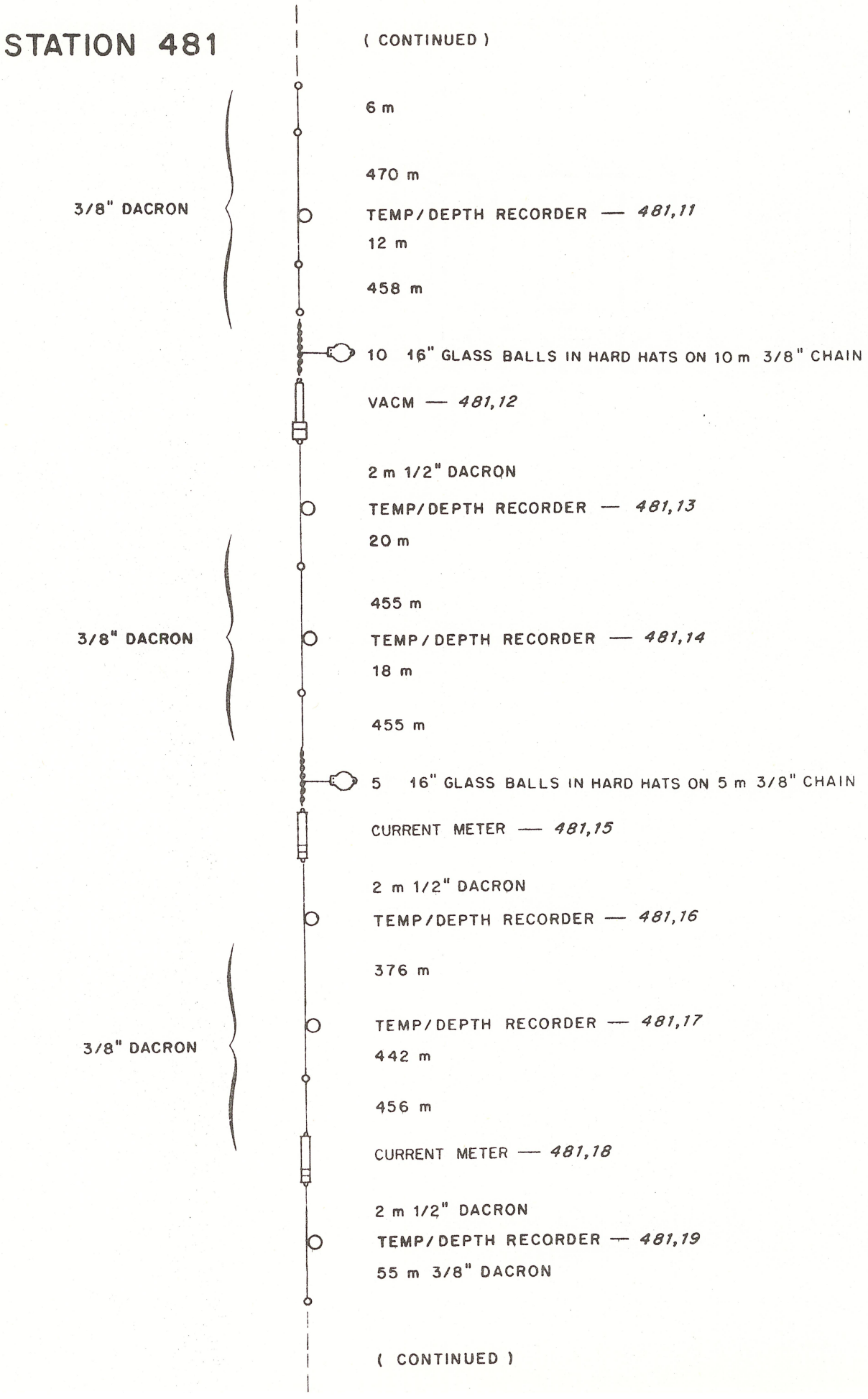
# STATION 481


( CONTINUED )
6 m
3/8" DACRON
470 m
TEMP/DEPTH RECORDER — 481,11
12 m
458 m
10 16" GLASS BALLS IN HARD HATS ON 10 m 3/8" CHAIN
VACM — 481,12
2 m 1/2" DACRON
TEMP/DEPTH RECORDER — 481,13
20 m
3/8" DACRON
455 m
TEMP/DEPTH RECORDER — 481,14
18 m
455 m
5 16" GLASS BALLS IN HARD HATS ON 5 m 3/8" CHAIN
CURRENT METER — 481,15
2 m 1/2" DACRON
TEMP/DEPTH RECORDER — 481,16
376 m
3/8" DACRON
TEMP/DEPTH RECORDER — 481,17
442 m
456 m
CURRENT METER — 481,18
2 m 1/2" DACRON
TEMP/DEPTH RECORDER — 481,19
55 m 3/8" DACRON
( CONTINUED )

# STATION 481

( CONTINUED )

15 16" GLASS BALLS IN HARD HATS ON 15 m 3/8" CHAIN

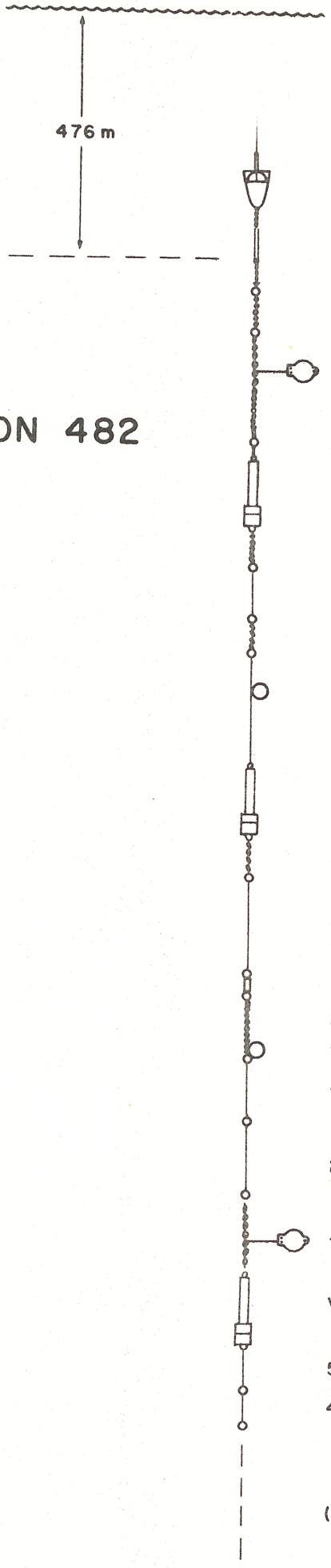
ACOUSTIC RELEASE, TRANSPONDING

20 m 3/4" NYLON

3 m 1/2" CHAIN

STIMSON ANCHOR, 2500 LBS

# STATION 482

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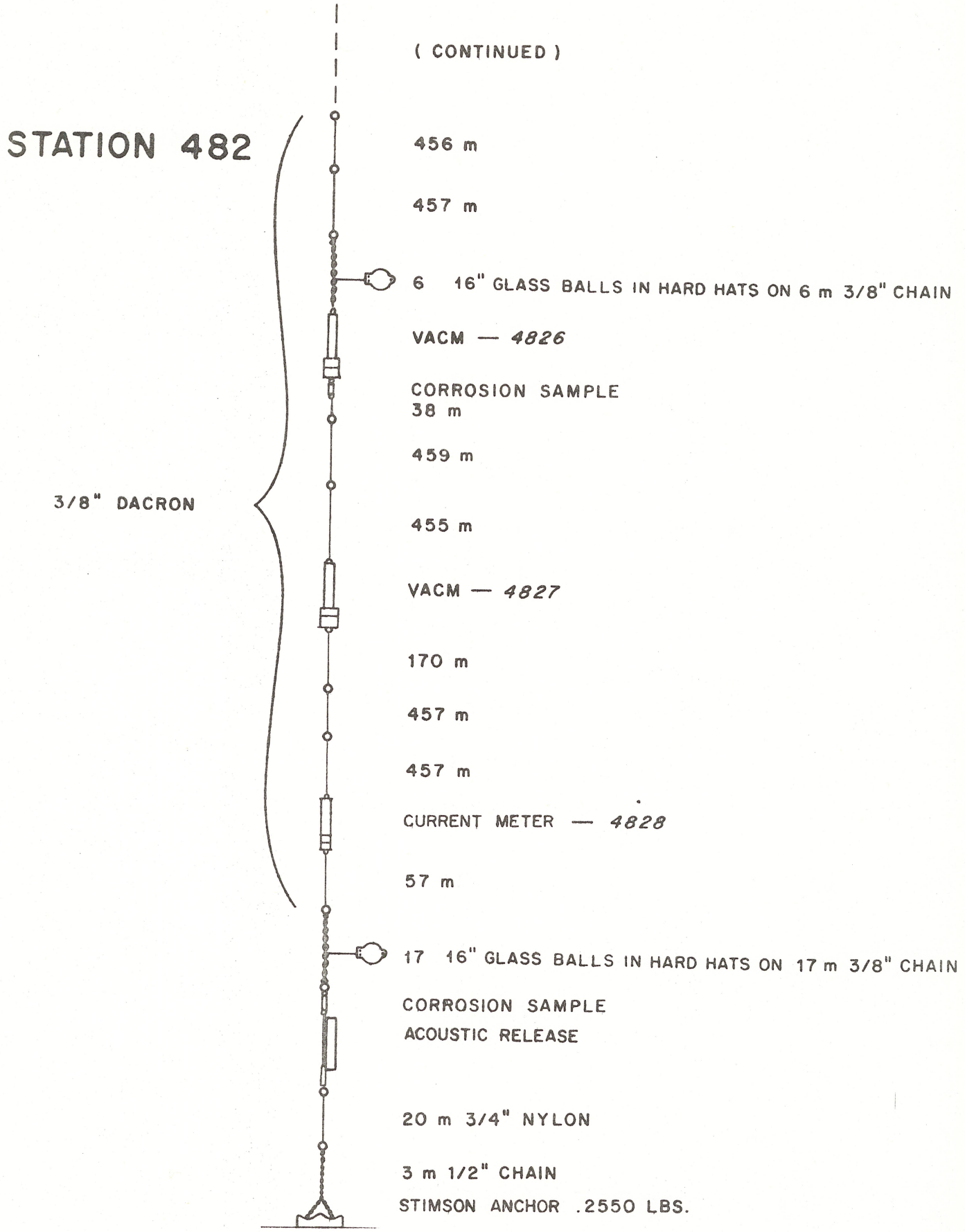
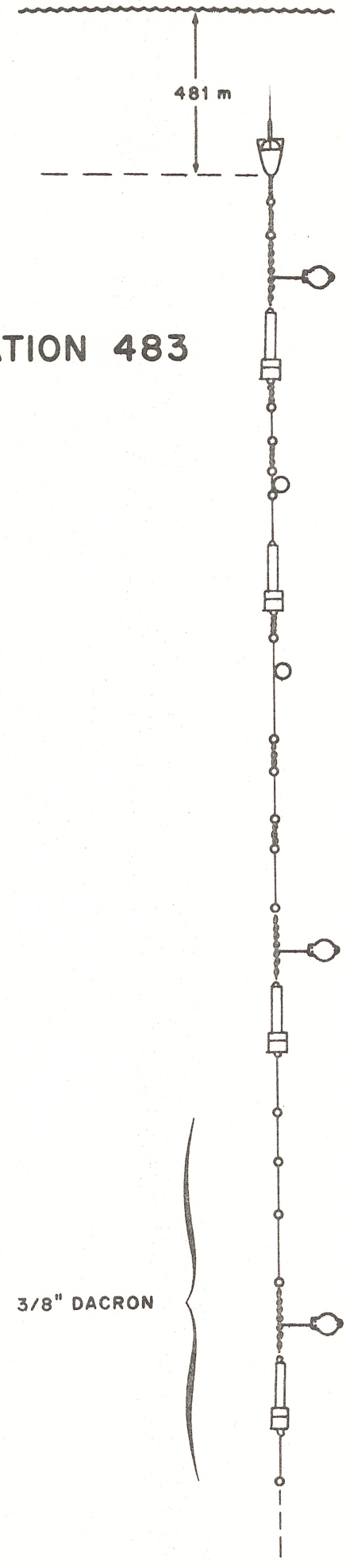

( CONTINUED )
STATION 482
456 m
457 m
6 16" GLASS BALLS IN HARD HATS ON 6 m 3/8" CHAIN
VACM — 4826
CORROSION SAMPLE
38 m
459 m
3/8" DACRON
455 m
VACM — 4827
170 m
457 m
457 m
CURRENT METER — 4828
57 m
17 16" GLASS BALLS IN HARD HATS ON 17 m 3/8" CHAIN
CORROSION SAMPLE
ACOUSTIC RELEASE
20 m 3/4" NYLON
3 m 1/2" CHAIN
STIMSON ANCHOR .2550 LBS.

# STATION 483

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# STATION 483

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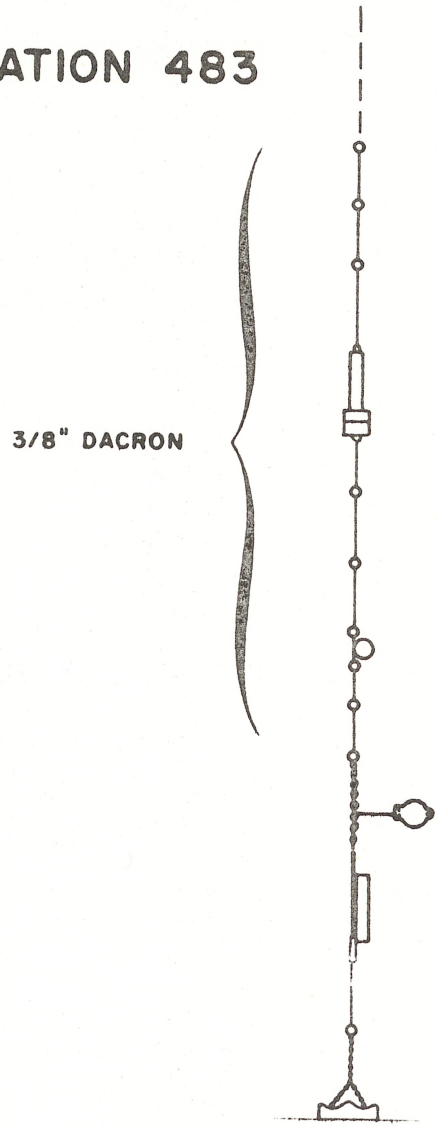

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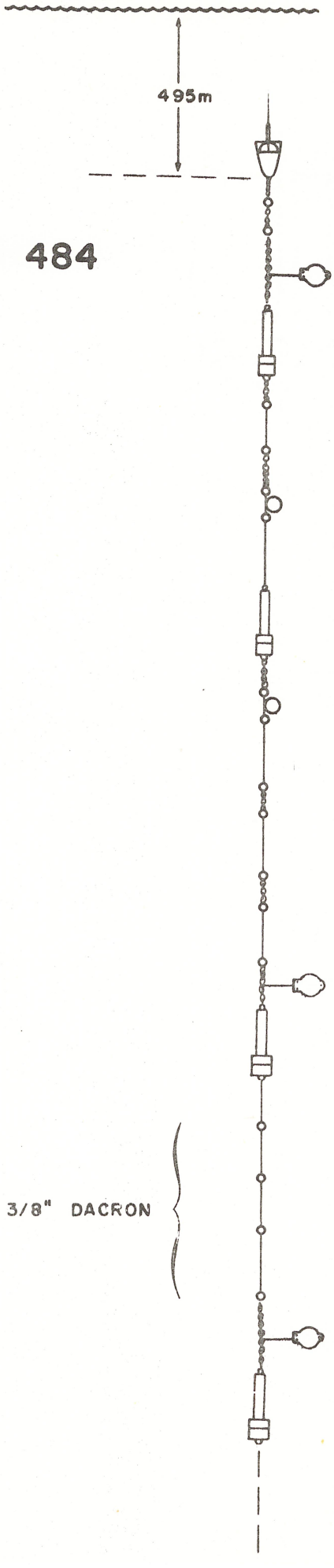
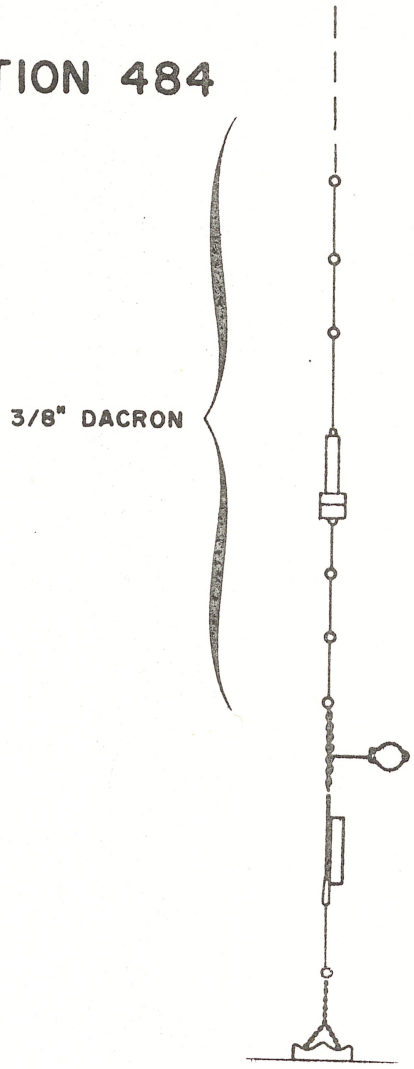
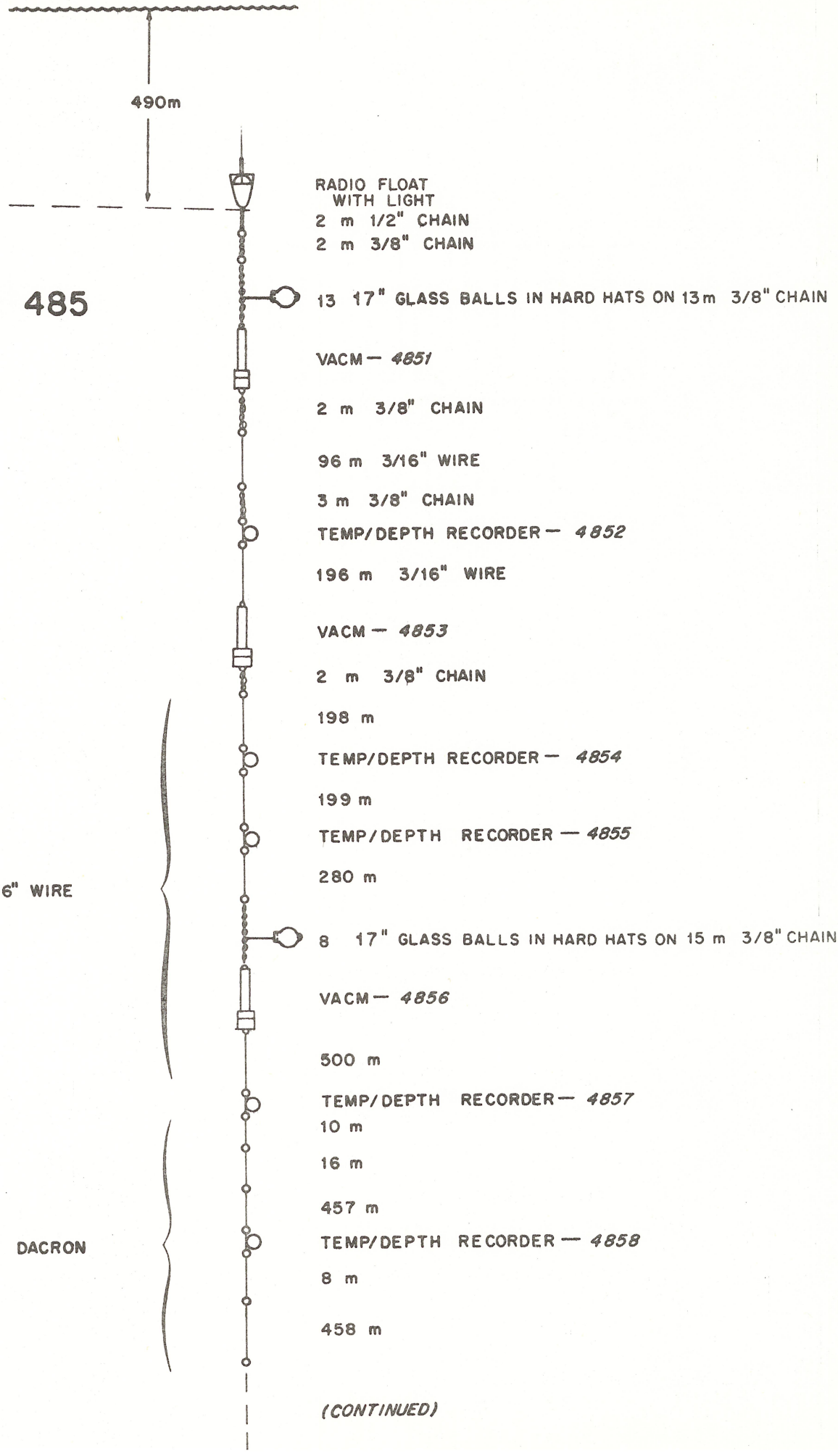

495m
RADIO FLOAT
WITH LIGHT
2 m 1/2" CHAIN
2 m 3/8" CHAIN
12 17" GLASS BALLS IN HARD HATS ON 12 m 3/8" CHAIN
VACM – 4841
2 m 3/8" CHAIN
96 m 3/16" WIRE
3m 3/8" CHAIN
TEMP/DEPTH RECORDER – 4842
196 m 3/16" WIRE
VACM – 4843
2 m 3/8" CHAIN
TEMP/DEPTH RECORDER – 4844
198 m 3/16" WIRE
1 m 3/8" CHAIN
199 m 3/16" WIRE
1 m 3/8" CHAIN
280 m 3/16" WIRE
8 17" GLASS BALLS IN HARD HAMSON 15 m 3/8" CHAIN
VACM – 4845
500 m 3/16" WIRE
42 m
3/8" DACRON
456 m
456 m
5 17" GLASS BALLS IN HARD HATS ON 5 m 3/8" CHAIN
VACM – 4846
(CONTINUED)

# STATION 484

*(CONTINUED)*



# STATION 485




*(CONTINUED)*

# STATION 485

*(CONTINUED)*

8 17" GLASS BALLS IN HARD HATS ON 8 m 3/8" CHAIN

VACM — *4859*

25 m

12 m

464 m

459 m

TEMP/DEPTH RECORDER — *485,10*

3/8" DACRON

374 m

TEMP/DEPTH RECORDER — *485,11*

37 m

413 m

429 m

TEMP/DEPTH RECORDER — *485,12*

2 m 1/2" DACRON

CURRENT METER — *485,13*

19 m 3/8" DACRON

36 m 3/8" DACRON

14 17" GLASS BALLS IN HARD HATS ON 14 m 3/8" CHAIN

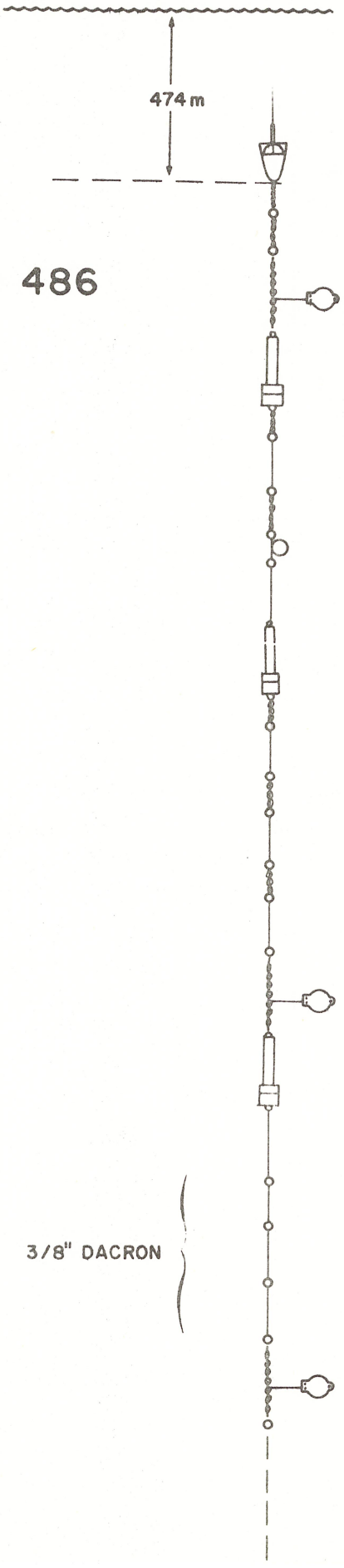
ACOUSTIC RELEASE, TRANSPONDING

20 m 3/4" NYLON

3 m 1/2" CHAIN

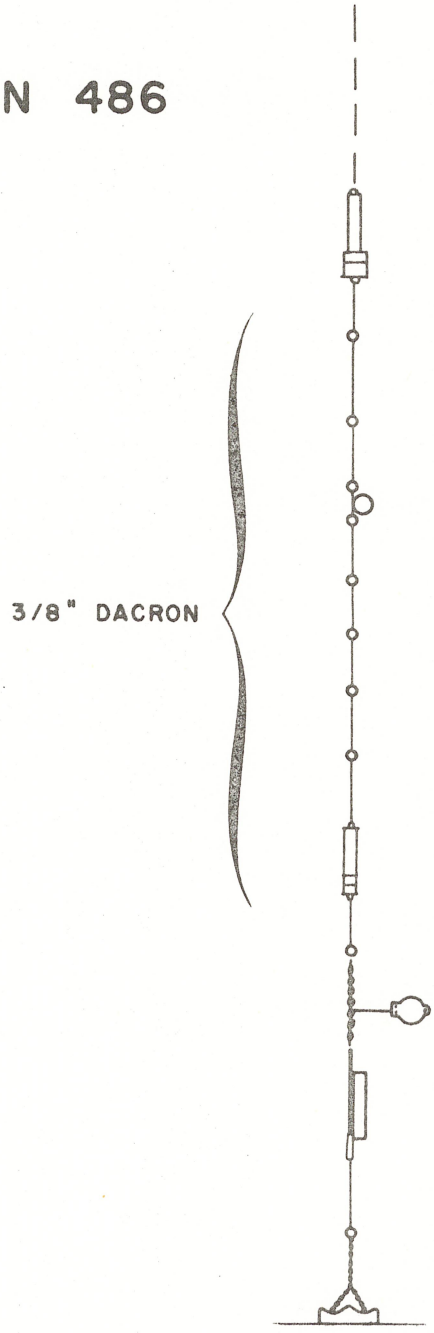
STIMSON ANCHOR, 2450 LBS.

# STATION 486


474 m
RADIO FLOAT
WITH LIGHT
2 m 1/2" CHAIN
2 m 3/8" CHAIN
12 17" GLASS BALLS IN HARD HATS ON 12 m 3/8" CHAIN
VACM. - 4861
2 m 3/8" CHAIN
96 m 3/16" WIRE
3 m 3/8" CHAIN
TEMP/DEPTH RECORDER - 4862
196 m 3/16" WIRE
VACM - 4863
2 m 3/8" CHAIN
198 m 3/16" WIRE
1 m 3/8" CHAIN
199 m 3/16" WIRE
1 m 3/8" CHAIN
280 m 3/16" WIRE
8 17" GLASS BALLS IN HARD HATS ON 15 m 3/8" CHAIN
VACM - 4864
500 m 3/16" WIRE
3/8" DACRON
37 m
457 m
457 m
5 17" GLASS BALLS IN HARD HATS ON 5m 3/8" CHAIN
(CONTINUED)

# STATION 486

*(CONTINUED)*



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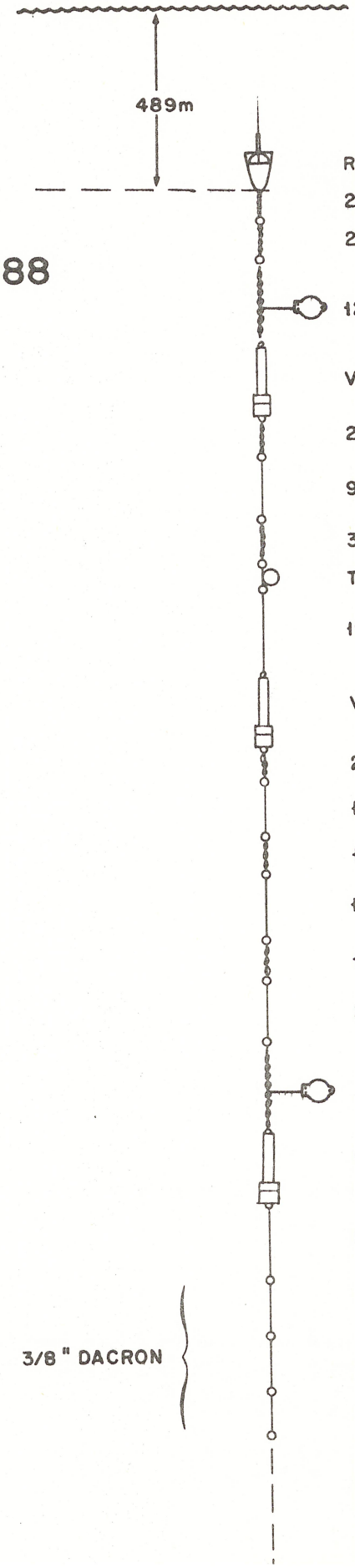


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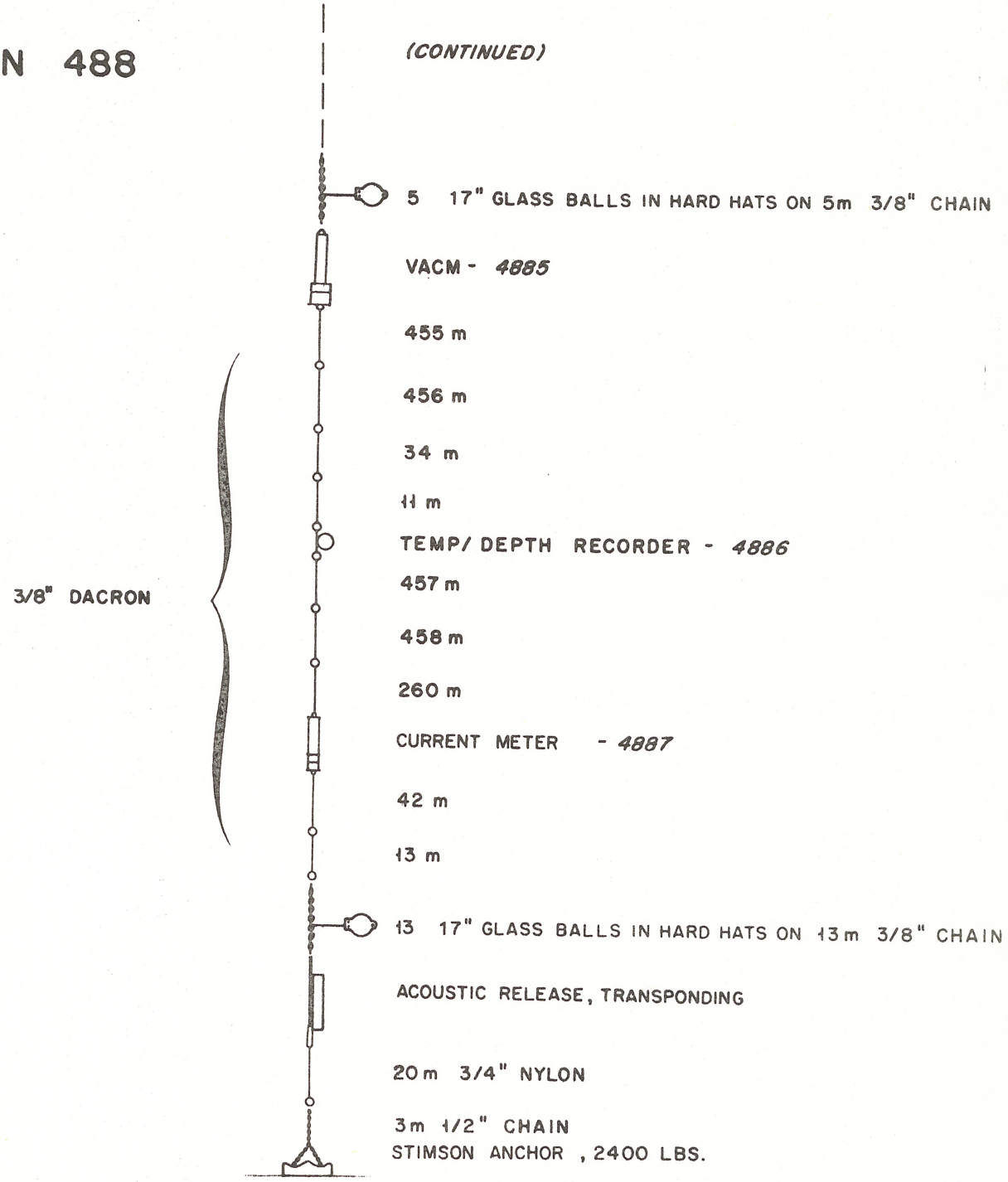
# STATION 488

*(CONTINUED)*



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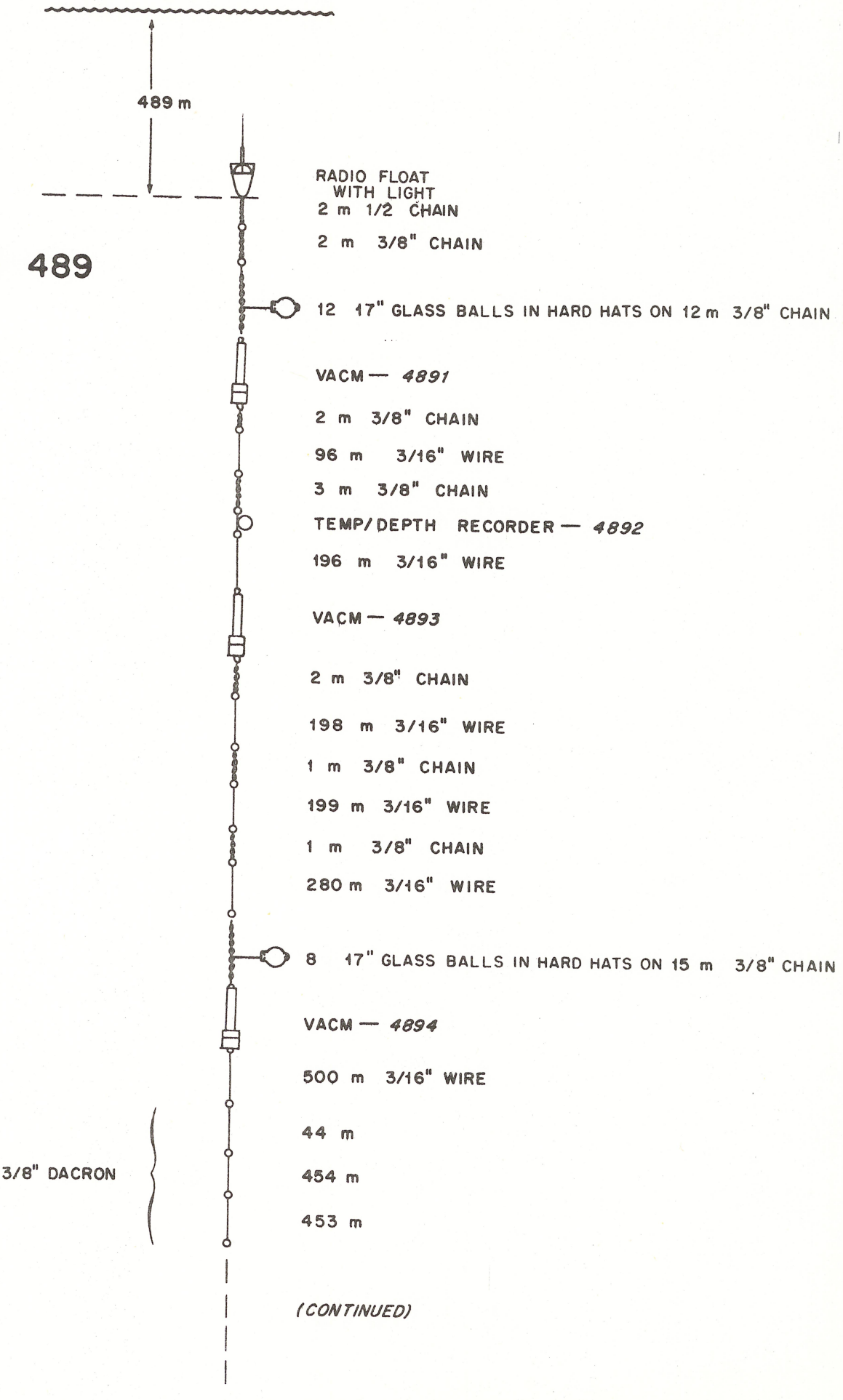
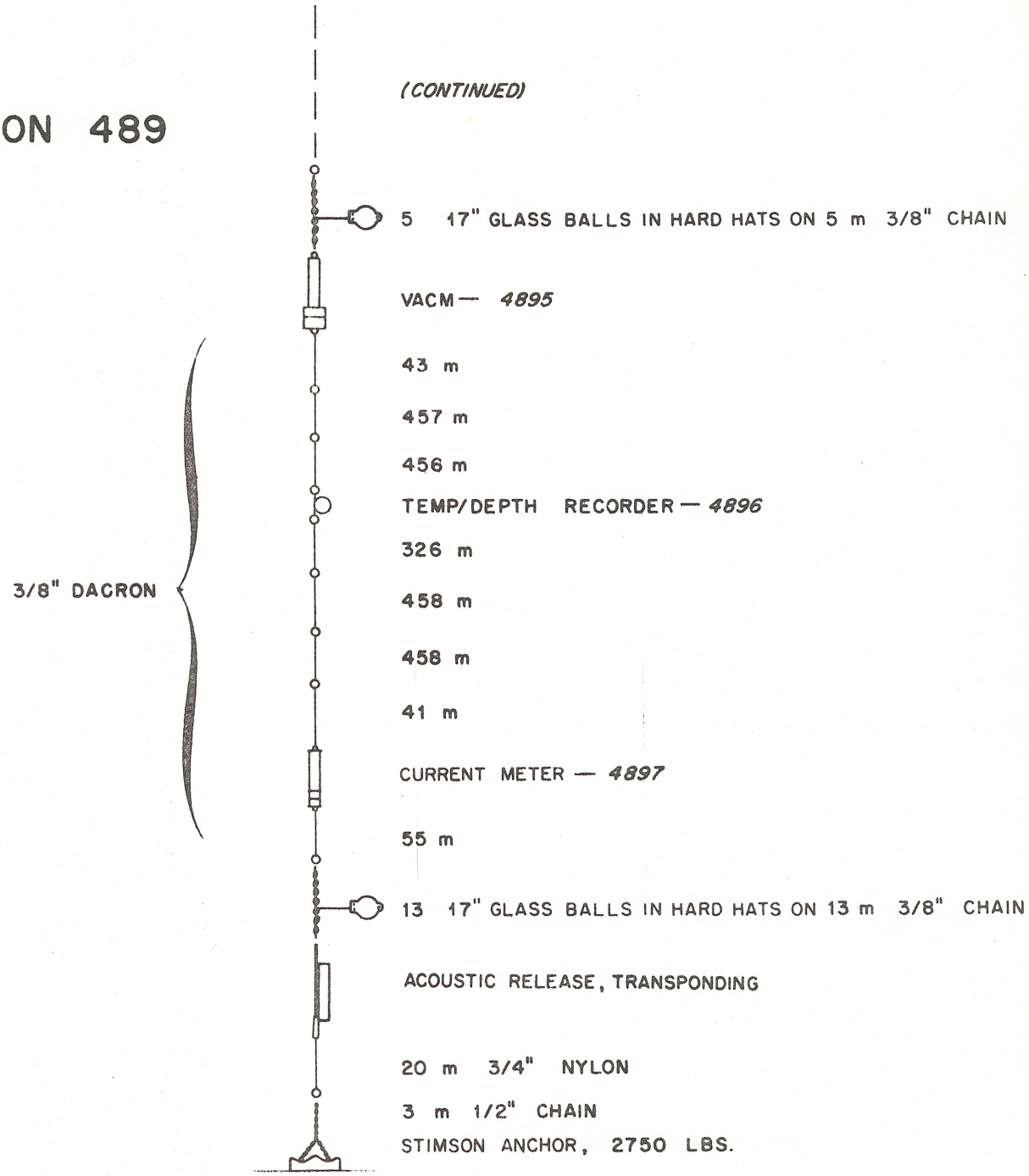
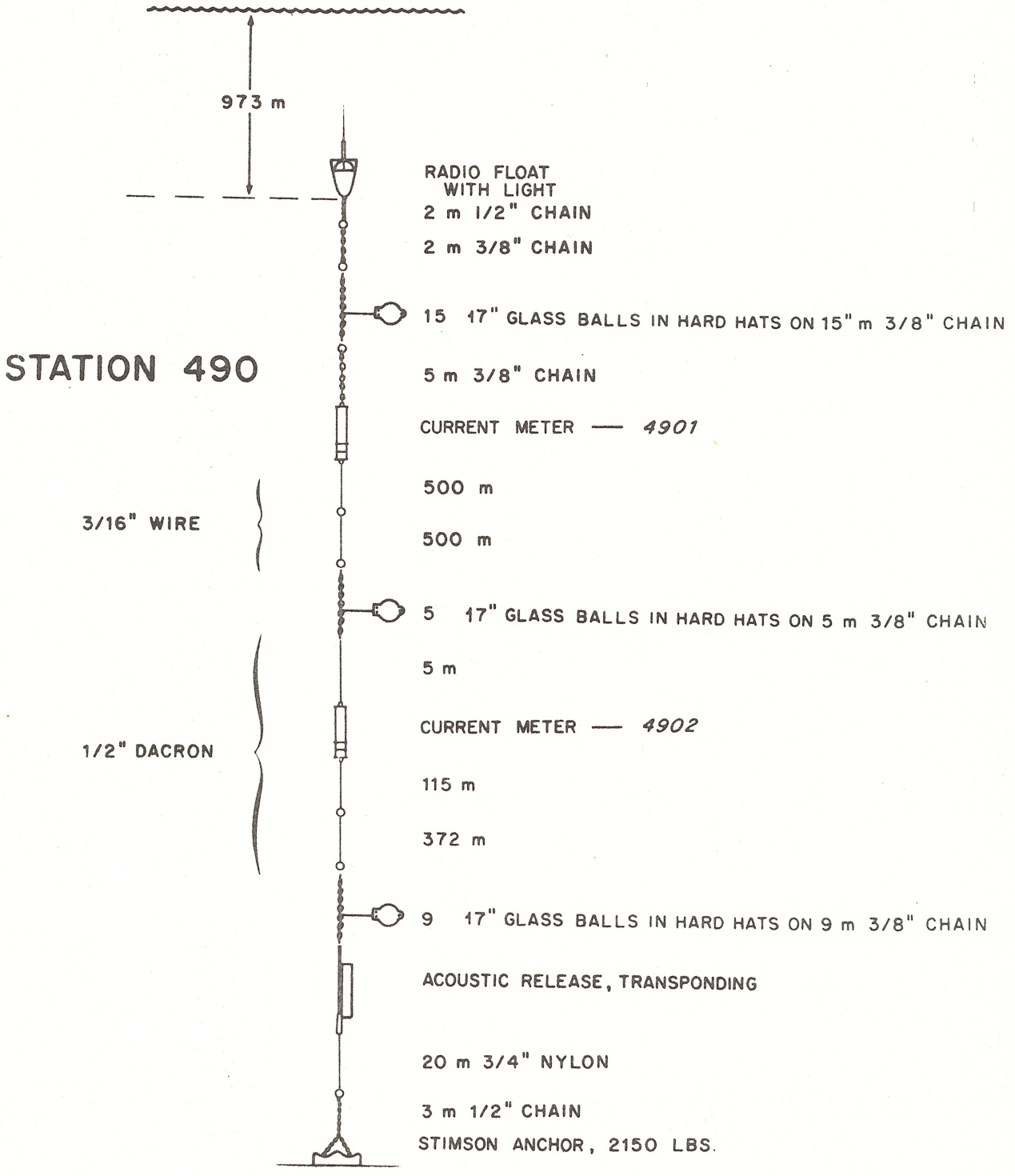
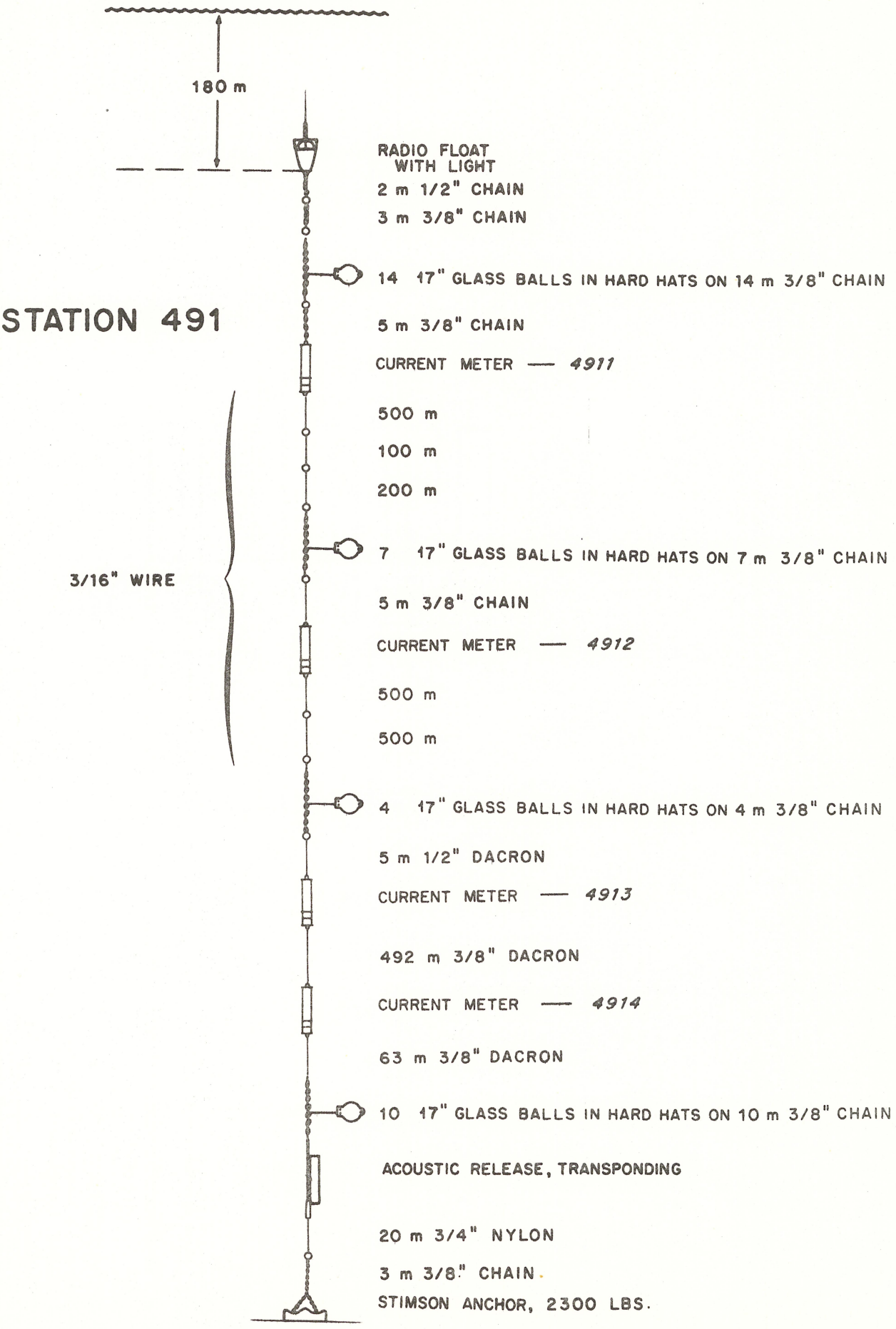
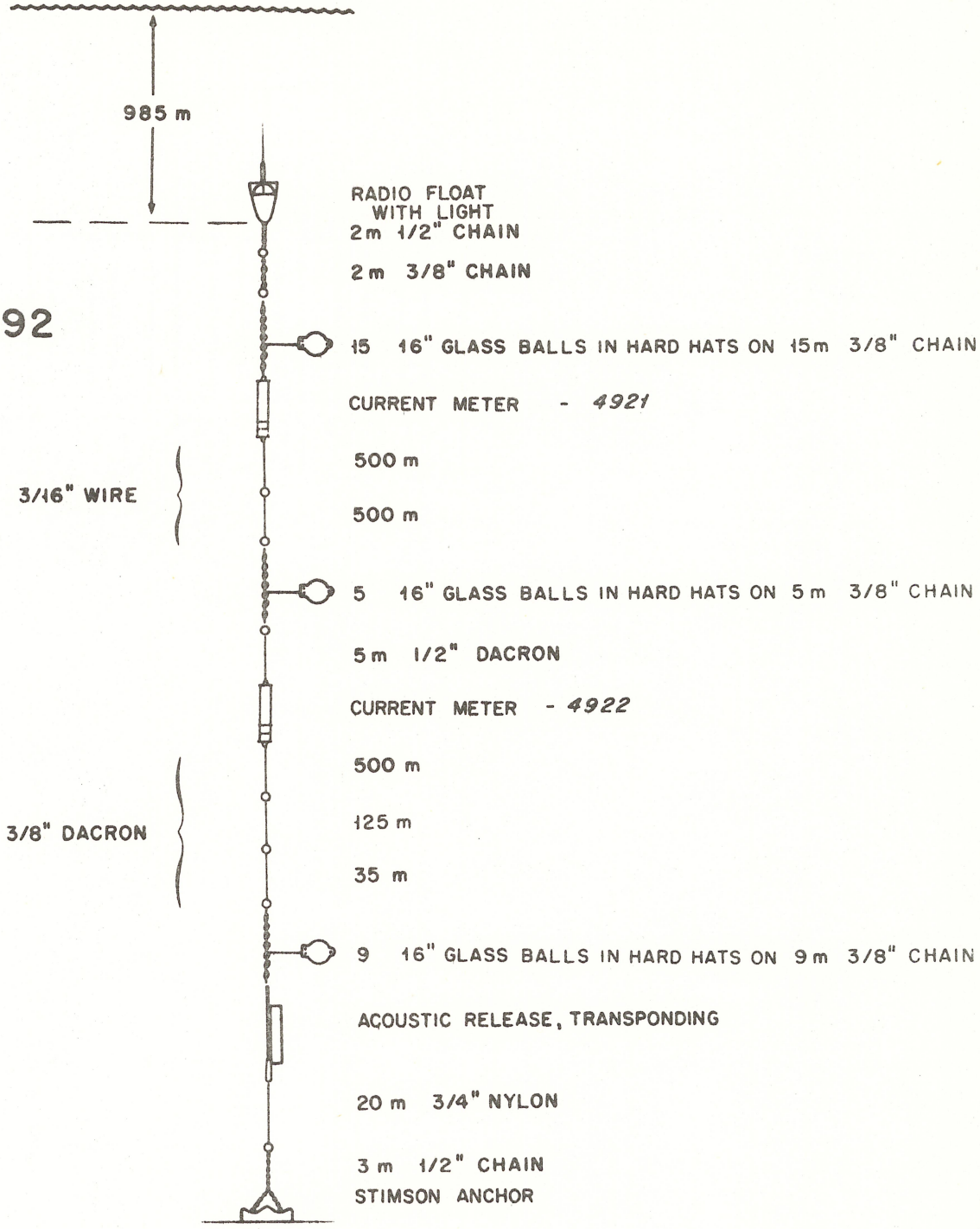

489 m
RADIO FLOAT
WITH LIGHT
2 m 1/2 CHAIN
2 m 3/8" CHAIN
12 17" GLASS BALLS IN HARD HATS ON 12 m 3/8" CHAIN
VACM — 4891
2 m 3/8" CHAIN
96 m 3/16" WIRE
3 m 3/8" CHAIN
TEMP/DEPTH RECORDER — 4892
196 m 3/16" WIRE
VACM — 4893
2 m 3/8" CHAIN
198 m 3/16" WIRE
1 m 3/8" CHAIN
199 m 3/16" WIRE
1 m 3/8" CHAIN
280 m 3/16" WIRE
8 17" GLASS BALLS IN HARD HATS ON 15 m 3/8" CHAIN
VACM — 4894
500 m 3/16" WIRE
3/8" DACRON
44 m
454 m
453 m
(CONTINUED)

# STATION 489

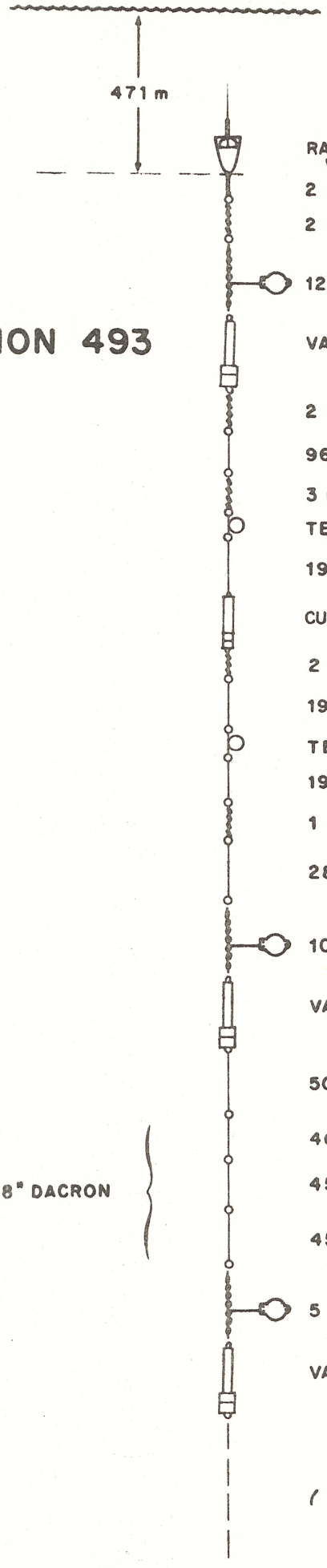

(CONTINUED)
5 17" GLASS BALLS IN HARD HATS ON 5 m 3/8" CHAIN
VACM — 4895
43 m
457 m
456 m
TEMP/DEPTH RECORDER — 4896
326 m
458 m
458 m
41 m
CURRENT METER — 4897
55 m
13 17" GLASS BALLS IN HARD HATS ON 13 m 3/8" CHAIN
ACOUSTIC RELEASE, TRANSPONDING
20 m 3/4" NYLON
3 m 1/2" CHAIN
STIMSON ANCHOR, 2750 LBS.
3/8" DACRON


973 m
RADIO FLOAT
WITH LIGHT
2 m 1/2" CHAIN
2 m 3/8" CHAIN
15 17" GLASS BALLS IN HARD HATS ON 15" m 3/8" CHAIN
STATION 490
5 m 3/8" CHAIN
CURRENT METER — 4901
500 m
3/16" WIRE
500 m
5 17" GLASS BALLS IN HARD HATS ON 5 m 3/8" CHAIN
5 m
CURRENT METER — 4902
1/2" DACRON
115 m
372 m
9 17" GLASS BALLS IN HARD HATS ON 9 m 3/8" CHAIN
ACOUSTIC RELEASE, TRANSPONDING
20 m 3/4" NYLON
3 m 1/2" CHAIN
STIMSON ANCHOR, 2150 LBS.


180 m
RADIO FLOAT
WITH LIGHT
2 m 1/2" CHAIN
3 m 3/8" CHAIN
14 17" GLASS BALLS IN HARD HATS ON 14 m 3/8" CHAIN
5 m 3/8" CHAIN
CURRENT METER — 4911
500 m
100 m
200 m
7 17" GLASS BALLS IN HARD HATS ON 7 m 3/8" CHAIN
5 m 3/8" CHAIN
CURRENT METER — 4912
500 m
500 m
4 17" GLASS BALLS IN HARD HATS ON 4 m 3/8" CHAIN
5 m 1/2" DACRON
CURRENT METER — 4913
492 m 3/8" DACRON
CURRENT METER — 4914
63 m 3/8" DACRON
10 17" GLASS BALLS IN HARD HATS ON 10 m 3/8" CHAIN
ACOUSTIC RELEASE, TRANSPONDING
20 m 3/4" NYLON
3 m 3/8" CHAIN
STIMSON ANCHOR, 2300 LBS.
STATION 491
3/16" WIRE


985 m
RADIO FLOAT
WITH LIGHT
2m 1/2" CHAIN
2m 3/8" CHAIN
15 16" GLASS BALLS IN HARD HATS ON 15m 3/8" CHAIN
CURRENT METER - 4921
500 m
3/16" WIRE
500 m
5 16" GLASS BALLS IN HARD HATS ON 5m 3/8" CHAIN
5m 1/2" DACRON
CURRENT METER - 4922
500 m
3/8" DACRON
125 m
35 m
9 16" GLASS BALLS IN HARD HATS ON 9m 3/8" CHAIN
ACOUSTIC RELEASE, TRANSPONDING
20 m 3/4" NYLON
3 m 1/2" CHAIN
STIMSON ANCHOR

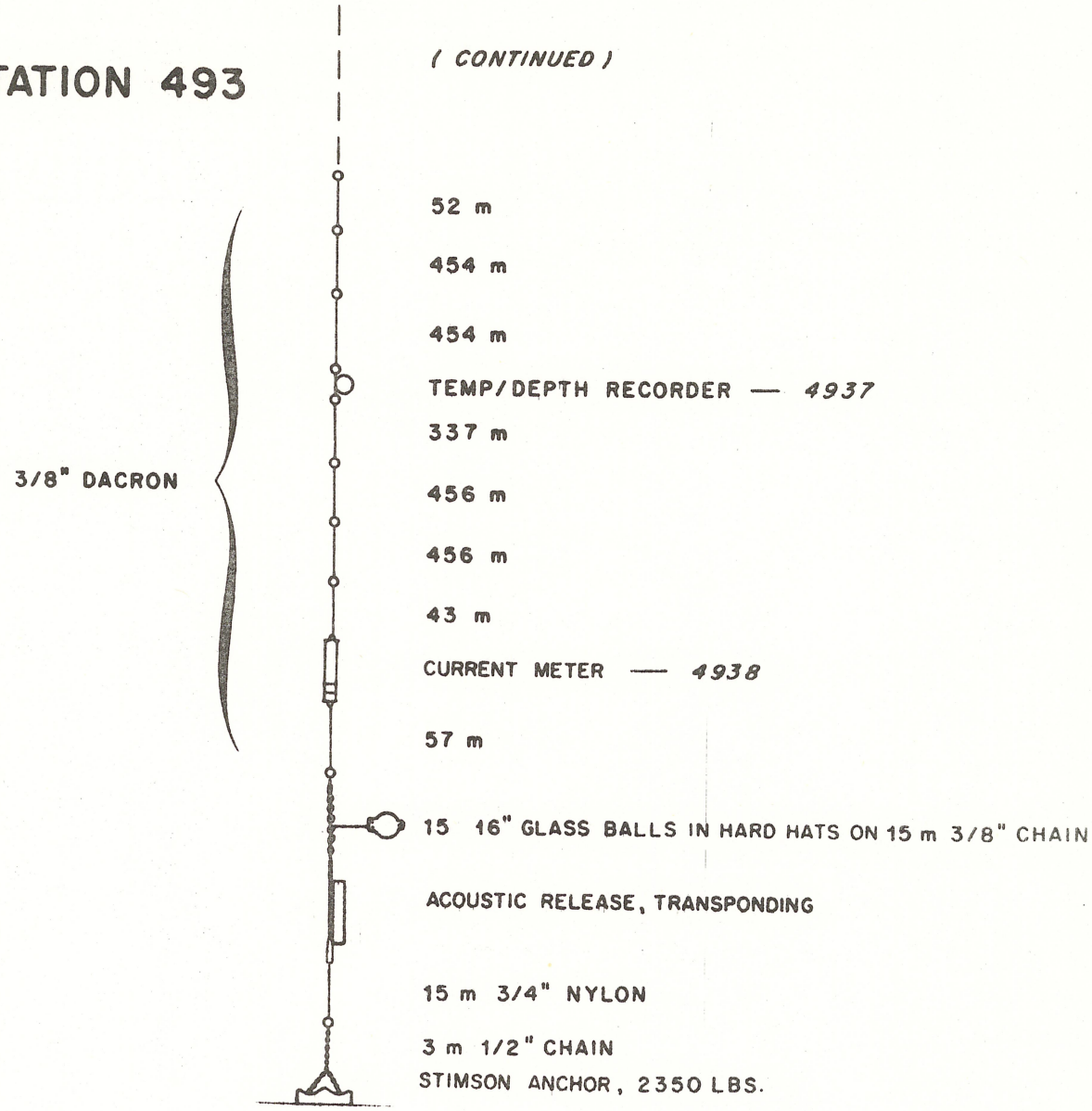
## STATION 492


471 m
RADIO FLOAT
WITH LIGHT
2 m 1/2" CHAIN
2 m 3/8" CHAIN
12-16" + 2-17" GLASS BALLS IN HARD HATS ON 3/8" CHAIN
VACM — 4931
2 m 3/8" CHAIN
96 m 3/16" WIRE
3 m 3/8" CHAIN
TEMP/DEPTH RECORDER — 4932
196 m 3/4" WIRE
CURRENT METER — 4933
2 m 3/8" CHAIN
198 m 3/16" WIRE
TEMP/DEPTH RECORDER — 4934
199 m 3/16" WIRE
1 m 3/8" CHAIN
280 m 3/16" WIRE
10 16" GLASS BALLS IN HARD HATS ON 15 m 3/8" CHAIN
VACM — 4935
500 m 3/16" WIRE
46 m
3/8" DACRON
456 m
457 m
5 16" GLASS BALLS IN HARD HATS ON 5 m 3/8" CHAIN
VACM — 4936
( CONTINUED )

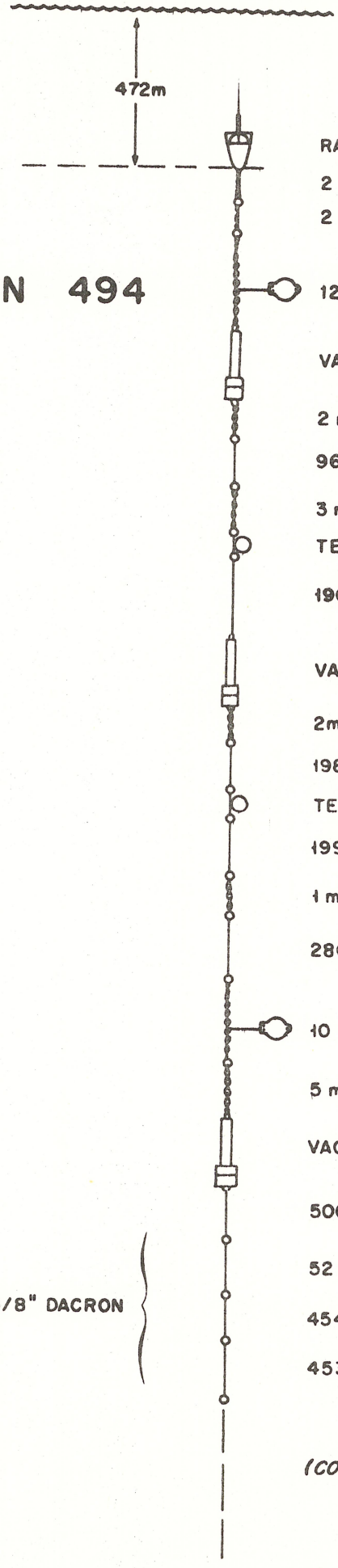
## STATION 493

# STATION 493

*( CONTINUED )*



# STATION 494

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# STATION 494

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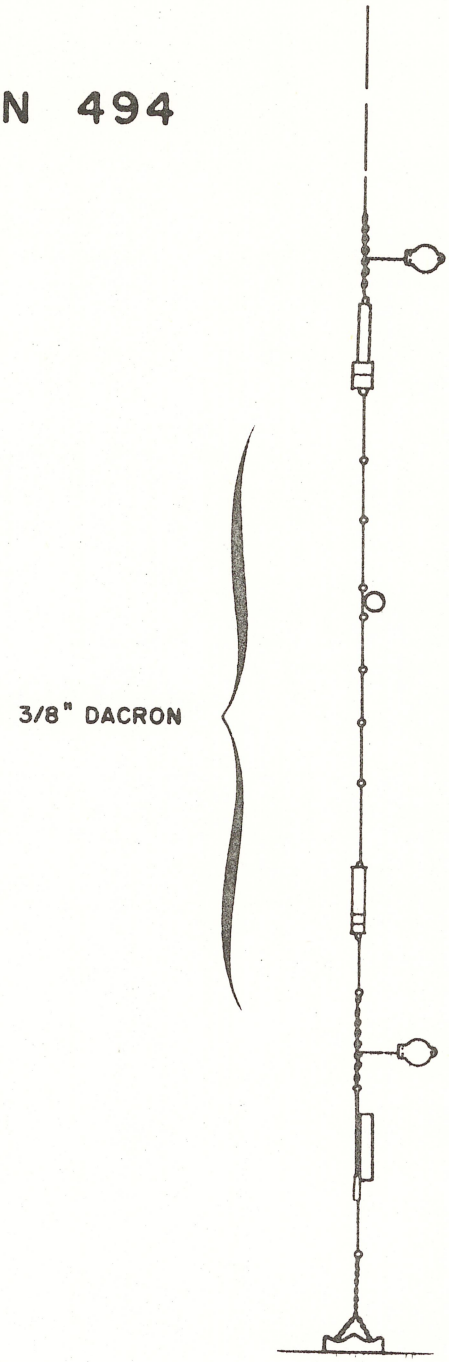

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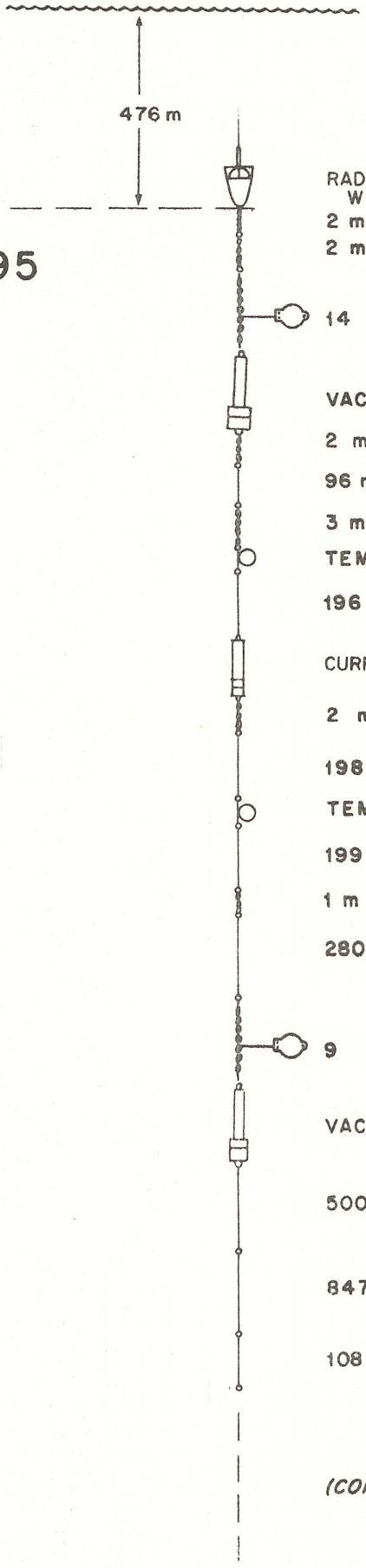


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# STATION 495

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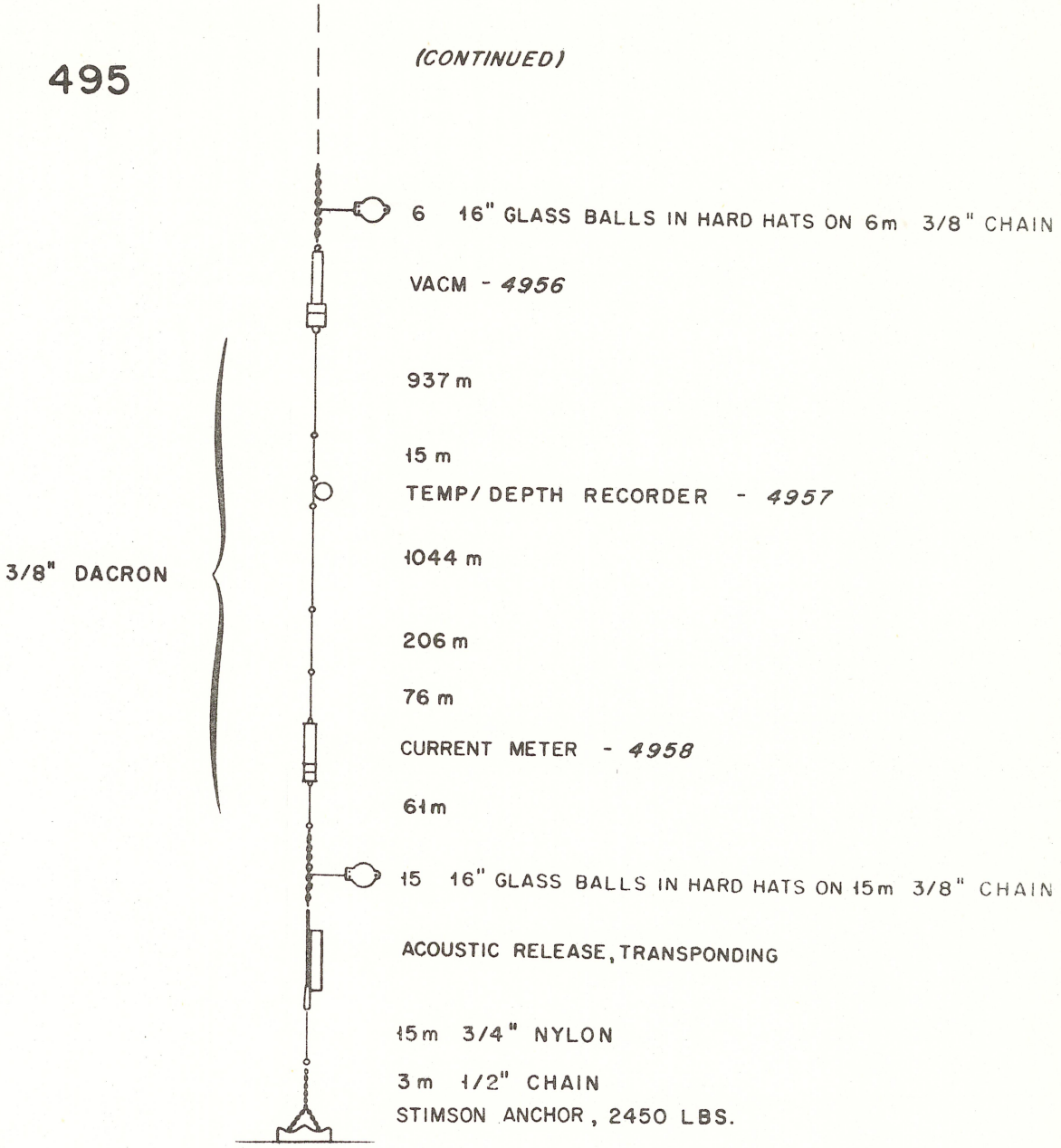

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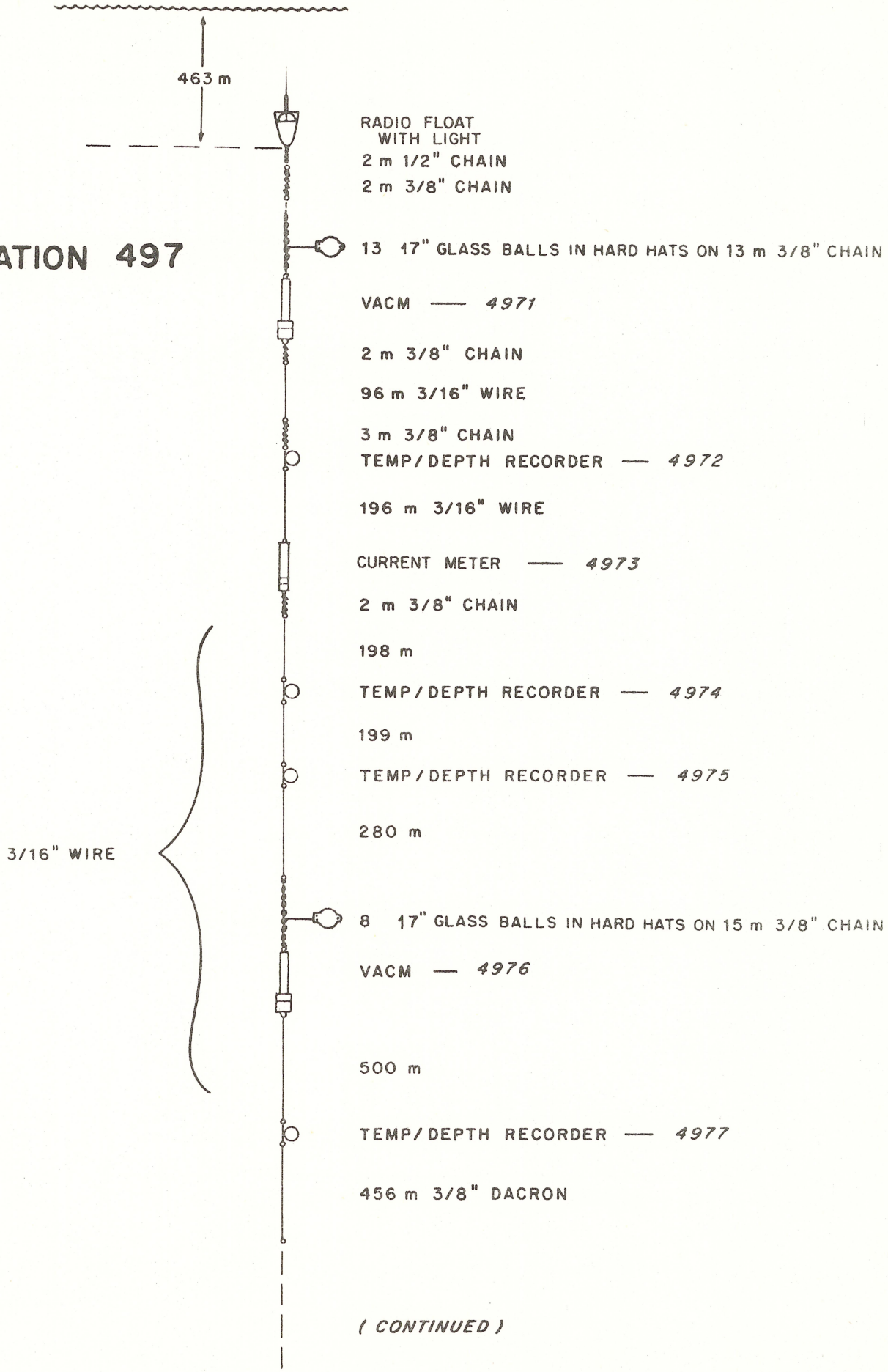


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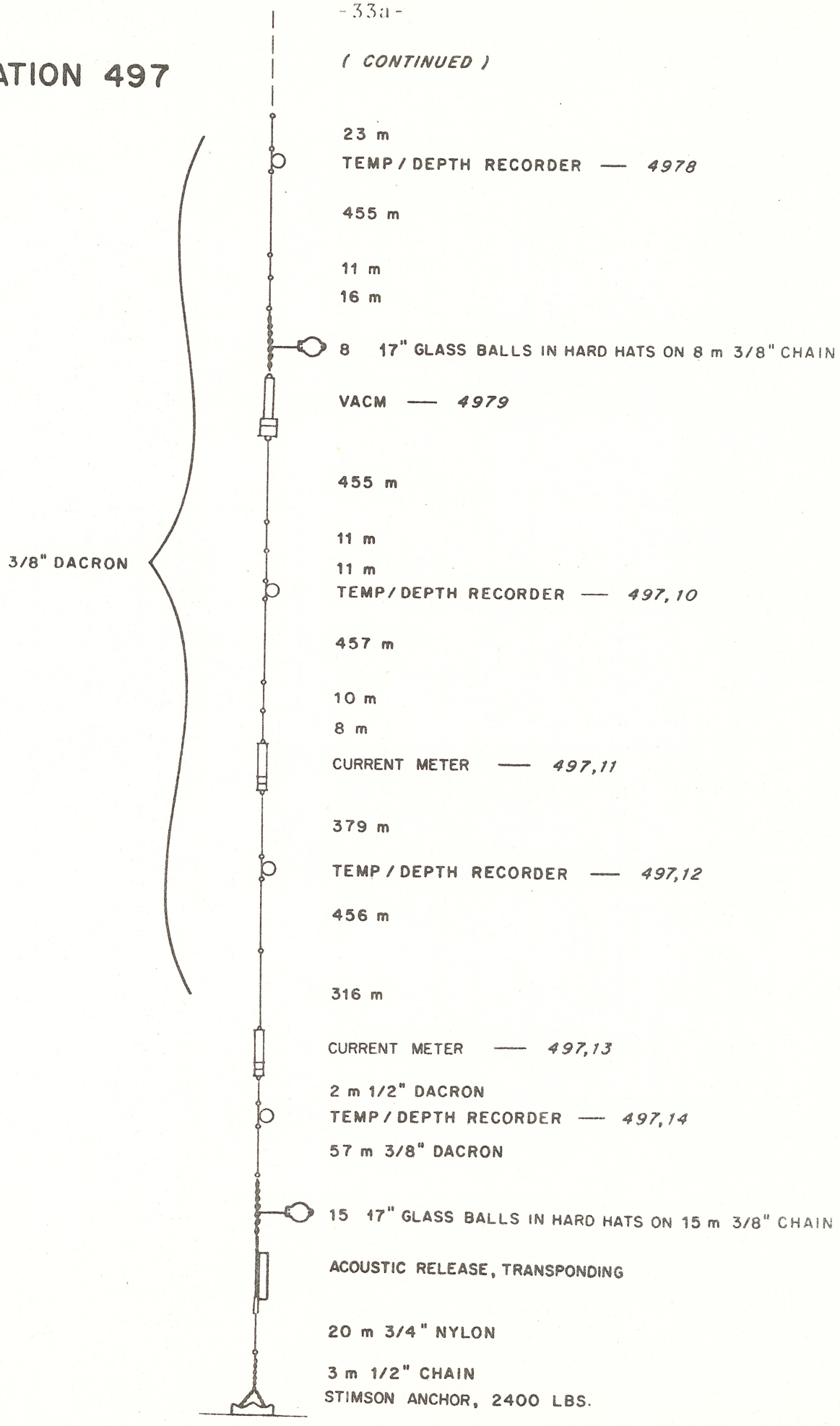
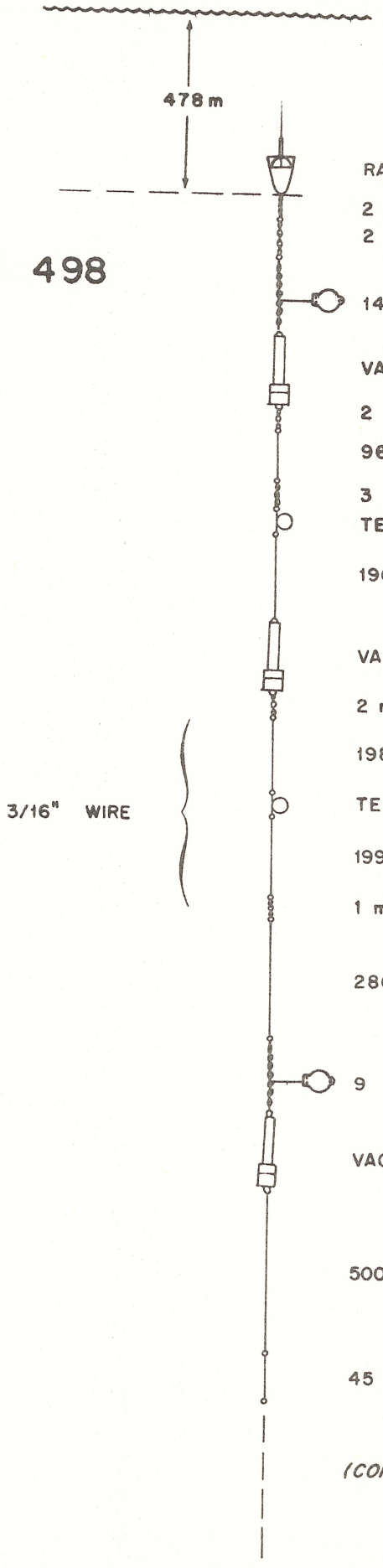
# STATION 497

*( CONTINUED )*

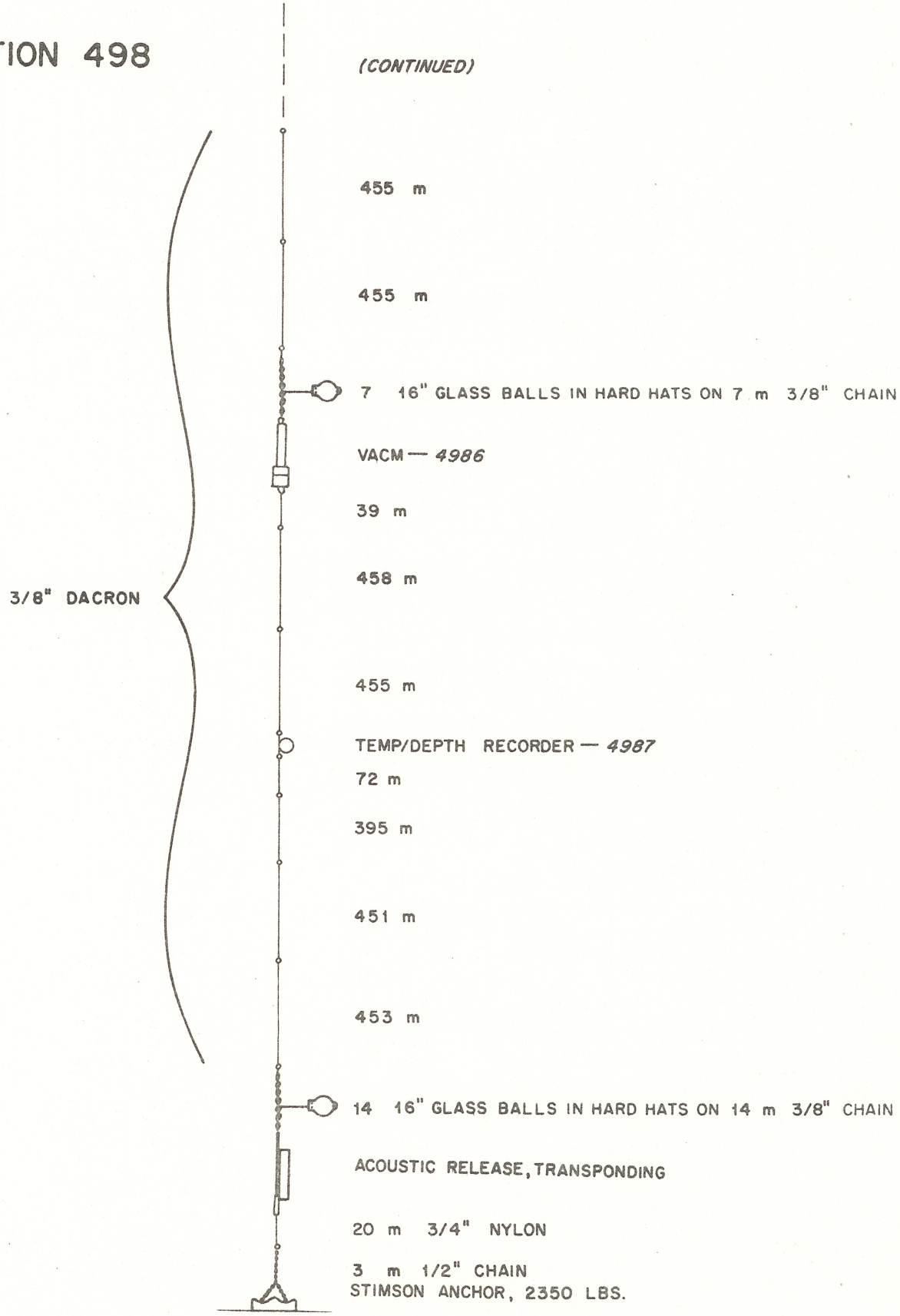


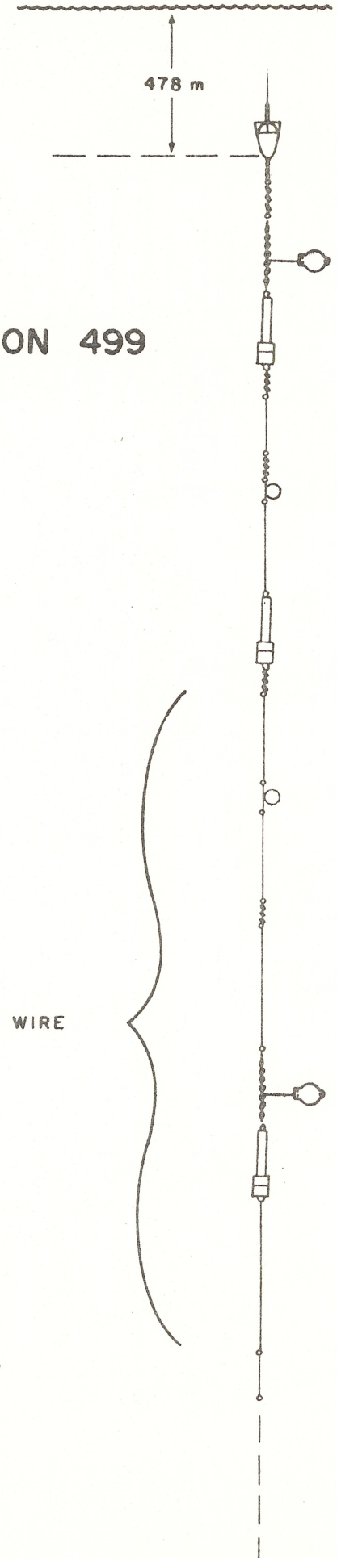
# STATION 498


478 m
RADIO FLOAT
WITH LIGHT
2 m 1/2" CHAIN + PLASTIC SAMPLE
2 m 3/8" CHAIN
14 16" GLASS BALLS IN HARD HATS ON 14 m 3/8" CHAIN
VACM — 4981
2 m 3/8" CHAIN
96 m 3/16" WIRE
3 m 3/8" CHAIN
TEMP/DEPTH RECORDER — 4982 + PLASTIC SAMPLE
196 m 3/16" WIRE
VACM — 4983
2 m 3/8" CHAIN
198 m
3/16" WIRE
TEMP/DEPTH RECORDER — 4984
199 m
1 m 3/8" CHAIN
280 m 3/16" WIRE
9 16" GLASS BALLS IN HARD HATS ON 15 m 3/8" CHAIN
+ PLASTIC SAMPLE
VACM — 4985
500 m 3/16" WIRE
45 m 3/8" DACRON
(CONTINUED)

# STATION 498

*(CONTINUED)*






## STATION 499

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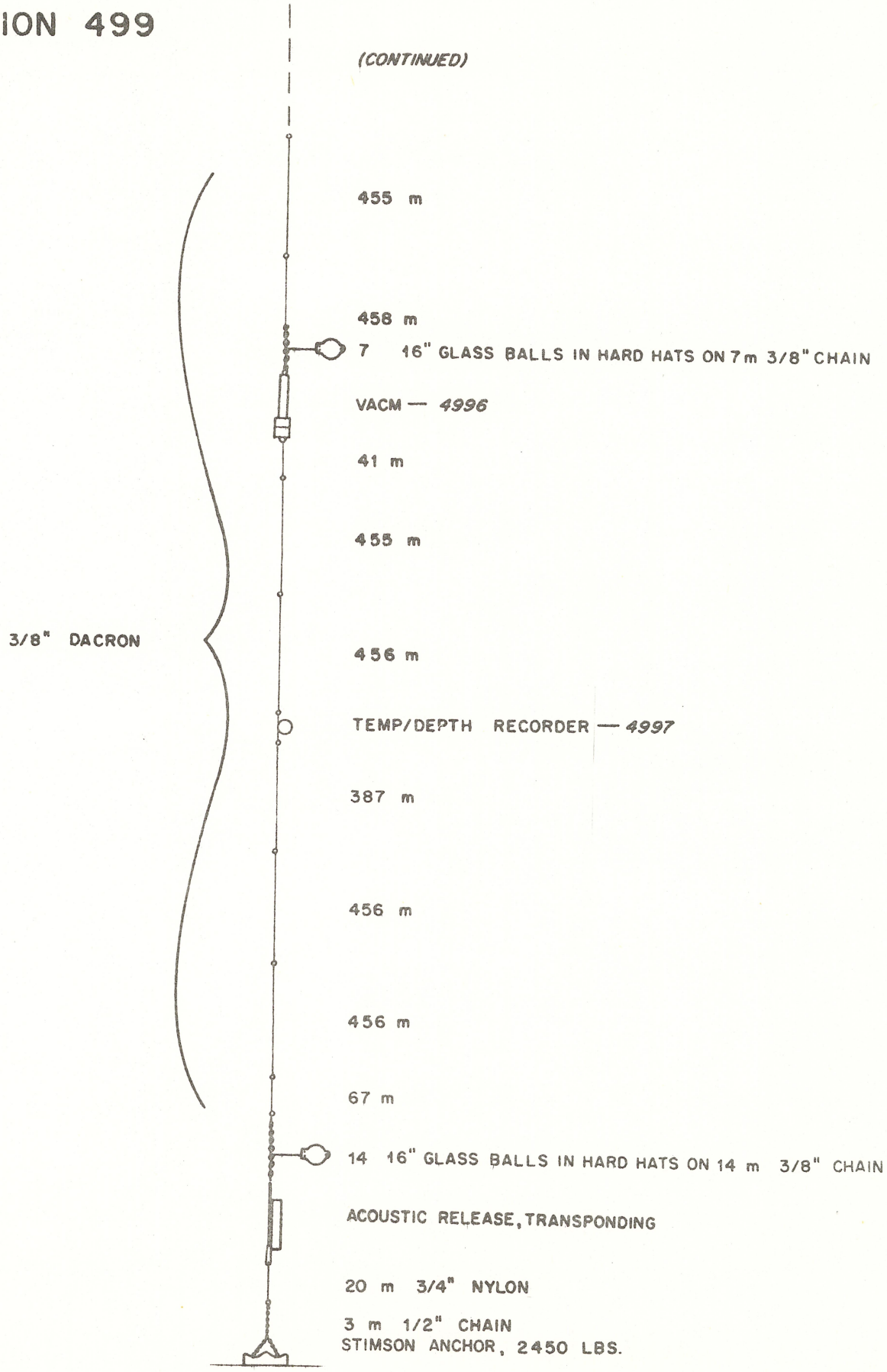
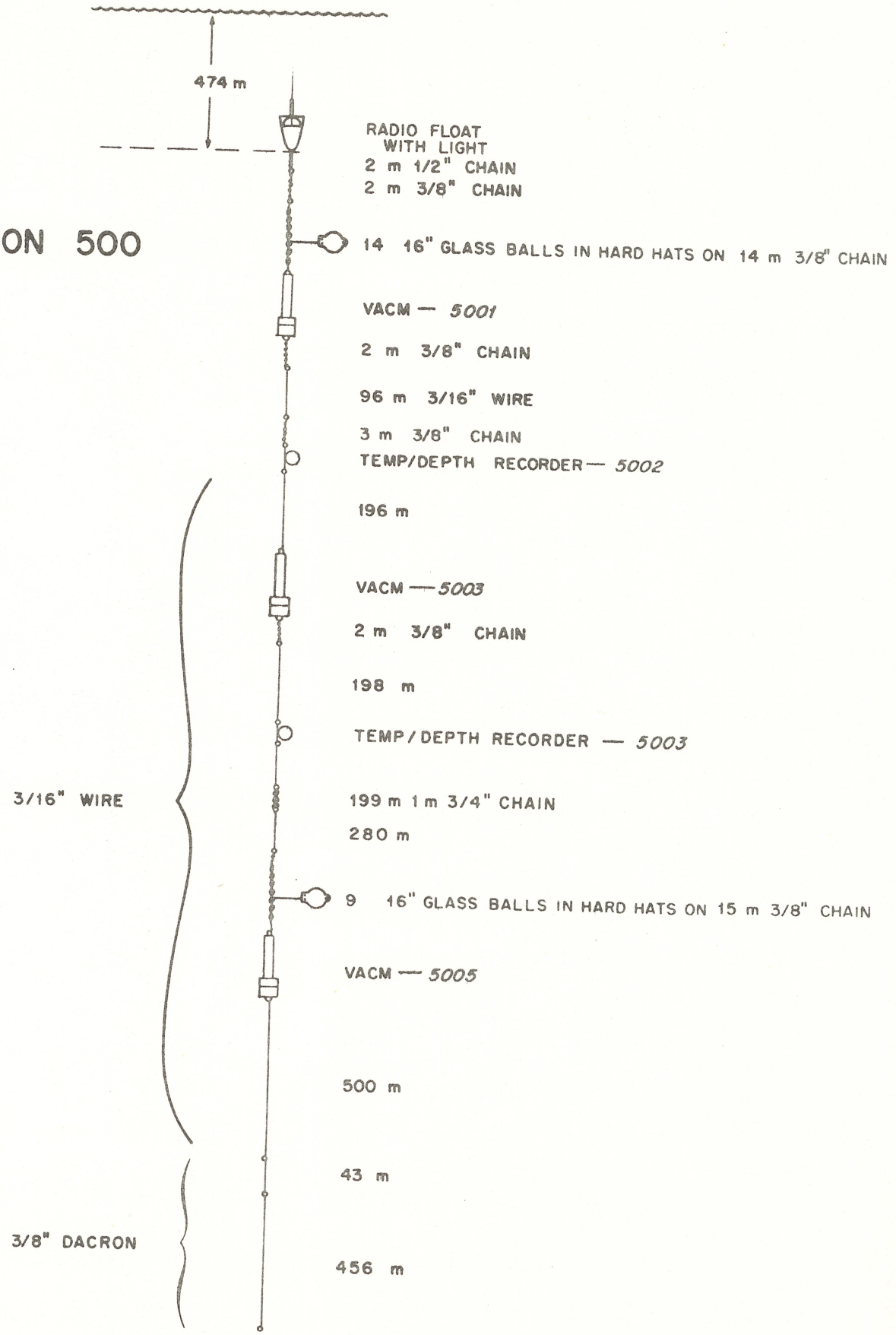
# STATION 499


(CONTINUED)
455 m
458 m
7 16" GLASS BALLS IN HARD HATS ON 7m 3/8" CHAIN
VACM — 4996
41 m
455 m
3/8" DACRON
456 m
TEMP/DEPTH RECORDER — 4997
387 m
456 m
456 m
67 m
14 16" GLASS BALLS IN HARD HATS ON 14 m 3/8" CHAIN
ACOUSTIC RELEASE, TRANSPONDING
20 m 3/4" NYLON
3 m 1/2" CHAIN
STIMSON ANCHOR, 2450 LBS.

# STATION 500

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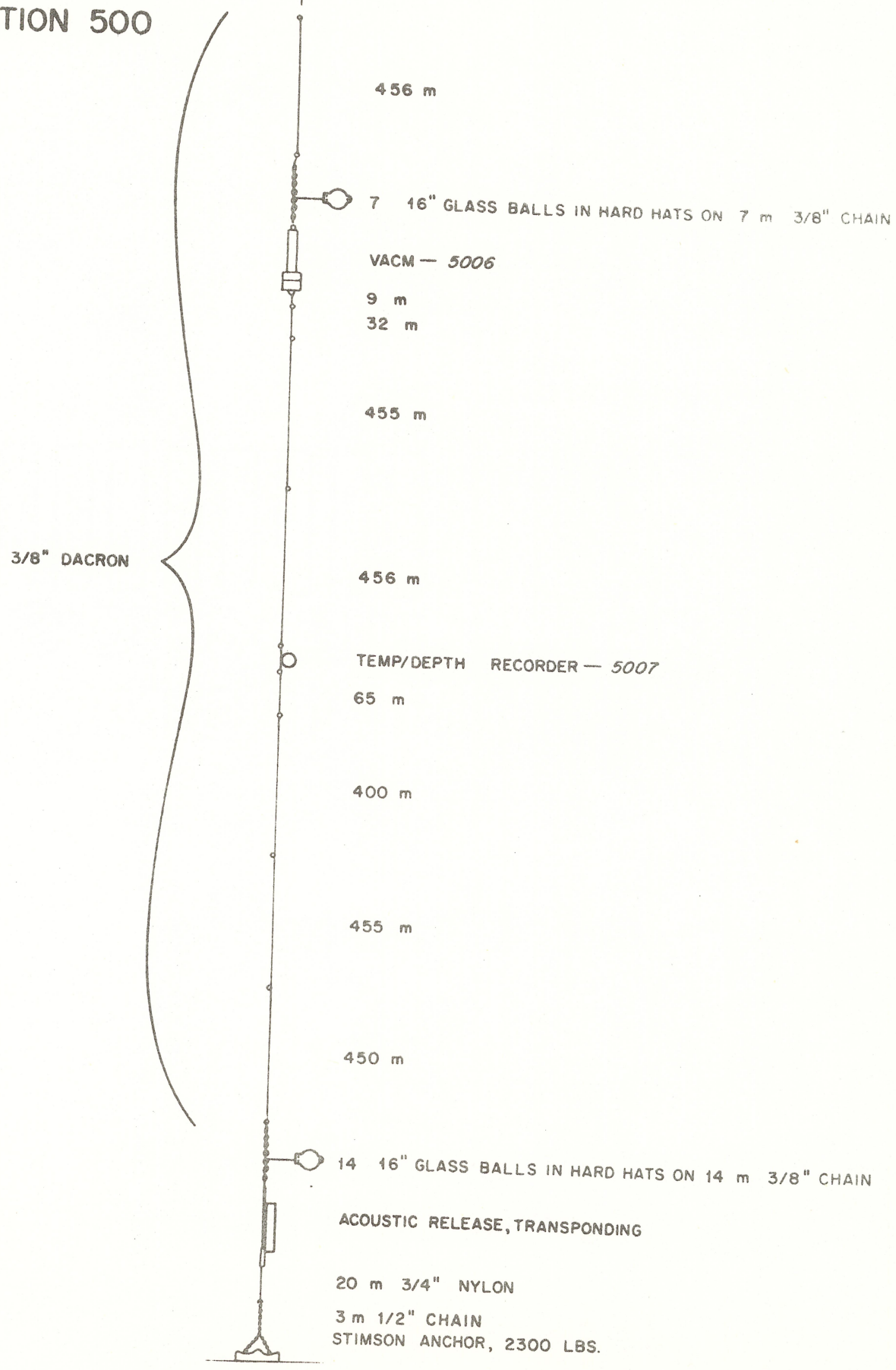

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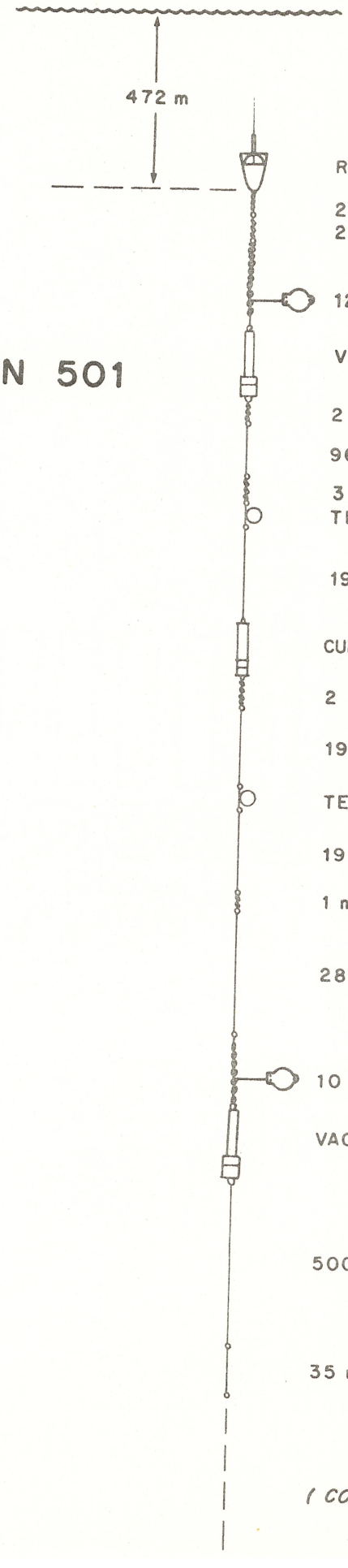
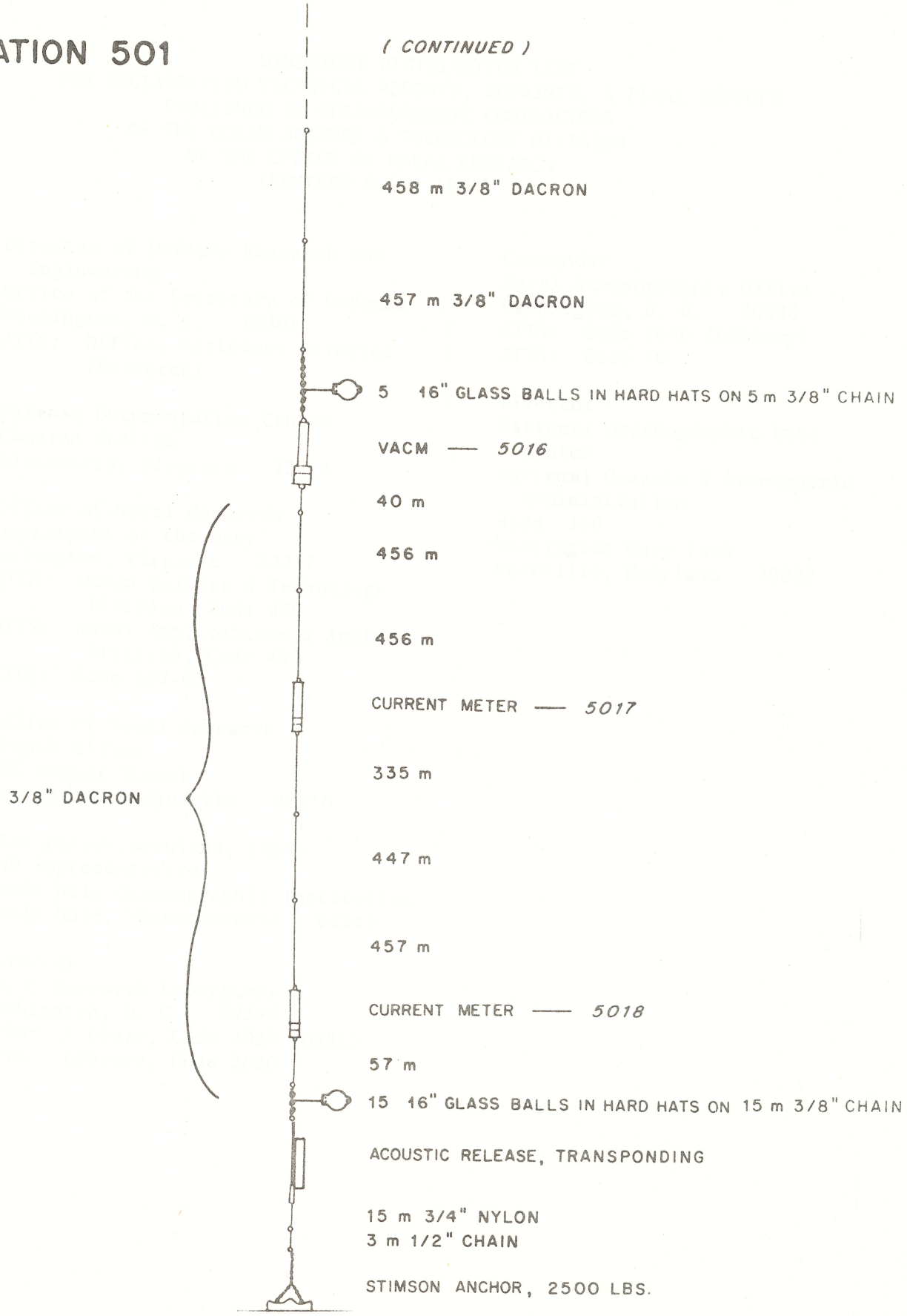

472 m
RADIO FLOAT
WITH LIGHT
2 m 1/2" CHAIN
2 m 3/8" CHAIN
12-16" + 2-17" GLASS BALLS IN HARD HATS ON 14 m
3/8" CHAIN
VACM — 5011
2 m 3/8" CHAIN
96 m 3/16" WIRE
3 m 3/8" CHAIN
TEMP/DEPTH RECORDER — 5012
196 m 3/16" WIRE
CURRENT METER — 5013
2 m 3/8" CHAIN
198 m 3/16" WIRE
TEMP/DEPTH RECORDER — 5014
199 m 3/16" WIRE
1 m 3/8" CHAIN
280 m 3/16" WIRE
10 16" GLASS BALLS IN HARD HATS ON 15 m 3/8" CHAIN
VACM — 5015
500 m 3/16" WIRE
35 m 3/8" DACRON
( CONTINUED )

# STATION 501

*( CONTINUED )*



Woods Hole Oceanographic Institution
WHOI-73-51

CRUISE REPORT: CHAIN 112, LEGS I and II, 6 MARCH - 5 APRIL, 1973 by R. Heinmiller, Chief Scientist. 8 Pages, 28 Figures. August 1973. Contract No. N00014-66-C0241; NR 083-004.

CHAIN 112, Legs I and II carried out mooring work from 6 March to 5 April, 1973. A total of 20 moorings was set and five recovered. All work was done near the 70th meridian at Site D (vicinity of 39°10'N., 70°00'W) and the MODE Site (vicinity of 28°N., 69°40'W.).

1. Moorings
2. Ocean Currents
3. MODE

I. Heinmiller, R.

II. N00014-66-C0241; NR 083-004

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1. Moorings
2. Ocean Currents
3. MODE

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1. Moorings
2. Ocean Currents
3. MODE

I. Heinmiller, R.

II. N00014-66-C0241; NR 083-004

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5. TYPE OF REPORT & PERIOD COVERED: Technical
6. PERFORMING ORG. REPORT NUMBER:
7. AUTHOR(s): R. Heinmiller, Chief Scientist
8. CONTRACT OR GRANT NUMBER(s): N00014-66-C0241
9. PERFORMING ORGANIZATION NAME AND ADDRESS: Woods Hole Oceanographic Institution, Woods Hole, Massachusetts 02543
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12. REPORT DATE: August 1973
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    2. Ocean Currents
    3. MODE
20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)*:

CHAIN 112, Legs I and II carried out mooring work from 6 March to 5 April, 1973. A total of 20 moorings was set and five recorded. All work was done near the 70th meridian at Site D (vicinity of 39°10'N., 70°00'W.) and the MODE Site (vicinity of 28°N, 69°40'W.).

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